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AFOEHL REPORT 89-112EQ0998KEF





Compliance Testing of the Clear AFS Power Plant, Coal-Fired Boiler 1 Clear AFS AK

PAUL T. SCOTT, Capt, USAF

October 1989

Final Report



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AF Occupational and Environmental Health Laboratory (AFSC)
Human Systems Division
Brooks Air Force Base, Texas 78235-5501

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CONTENTS

		Page
	DD Form 1473 Illustrations	i iv
Ι.	INTRODUCTION	1
II.	DISCUSSION	1
	A. BackgroundB. Site DescriptionC. Applicable StandardsD. Sampling Methods and Procedures	1 1 4 5
III.	CONCLUSIONS	8
IV.	RECOMMENDATION	9
	References	10
	Appendix	
	A Personnel B Permit to Operate No. 8731-A004 C State Regulations D Power Plant Operating Logs E Field Data, 20 Jun 89 F Field Data, 21 Jun 89 G Field Data, 22 Jun 89 H EPA Method 9 certification I Emission Calculations J Calibration Data	11 15 21 35 41 57 73 89 93 101
	Distribution List	107

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Illustrations

Figure	Title	Page	
1 2	Clear AFS Power Plant Schematic of Cyclone Separator	2 3	
3 4 5	Exhaust Stack of Boiler #1 ORSAT Sampling Probe ORSAT Analyzer	4 6 6	
6	Particulate Sampling Train	7	
Table	Stack Emissions Test Results	8	



I. INTRODUCTION

On 19-22 Jun 1989, stationary compliance testing for particulates and visible emissions was accomplished on boiler 1 of the Clear AFS Power Plant by personnel of the Air Quality Function, Environmental Quality Division, Air Force Occupational and Environmental Health Laboratory (AFOEHL). This survey was requested by 13 MWS/DE via HQ AFSPACECOM/SG to satisfy renewal requirements of Alaska Department of Environmental Conservation (DEC) Air Quality Control Permit to Operate No. 8731-AA004. Personnel involved with on-site testing are listed in Appendix A.

II. DISCUSSION

A. Background

On 3 February 1987 Clear AFS requested a permit modification to allow limited burning of waste oil for their power plant shown in Figure 1. The Alaska DEC rescinded Permit to Operate No. 8331-AA003 and issued Permit No. 8731-AA004 (Appendix B) allowing the burning of waste oil. As a condition of this new permit and the Alaska DEC, source testing was required to determine particulate and visible emissions of one representative boiler in conformance with Title 40, Code of Federal Regulations, Chapter 60.8 (40 CFR 60.8) and 40 CFR 60, Appendix A, to certify compliance with Title 18, Alaska Administrative Code, Chapter 50 - Air Quality Control (18 AAC 50). The source testing was required before the expiration of permit No. 8731-AA004 on 30 January 1990. In addition, the permit limits the operation of the boilers to the maximum steam load at which the associated visible and particulate emissions meet the applicable standards.

The Clear AFS Power Plant and 13 MWS/DE through AFSPACECOM/SG requested the services of AFOEHL to concurrently determine particulate emissions and visible emissions from a representative boiler in accordance with 40 CFR 60, Appendix A, Reference Methods 1-5 and Reference Method 9, respectively.

B. Site Description

The Clear AFS Power Plant operates three spreader-stoker coal-fired boilers. The three identical boilers, installed and built by Erie City Iron Works, became operational in June 1961 and were originally rated at 100,000 pounds of steam per hour (lbs steam/hr). The boilers primarily supply steam to three General Electric (GE) steam turbine generators. Each GE turbine produces 7.5 Megawatts of electrical power, and at least two turbines are always on line.

Air pollution controls for each boiler consist of a number of multiclone mechanical dust collectors (Figure 2) manufactured by Cycl-Trel and located in the boiler exhaust duct upstream of the induced draft fan. The exhaust effluent from each boiler is ducted to a separate exhaust stack extending through the roof of the power plant. Figure 3 shows the exhaust stack of boiler 1.

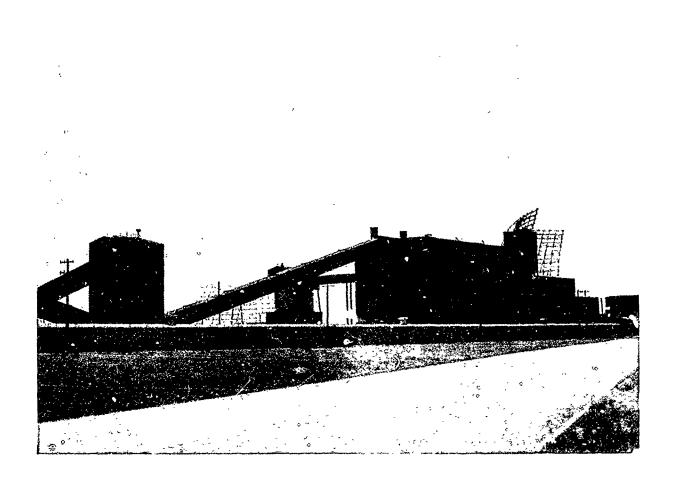


Figure 1. Clear AFS Power Plant

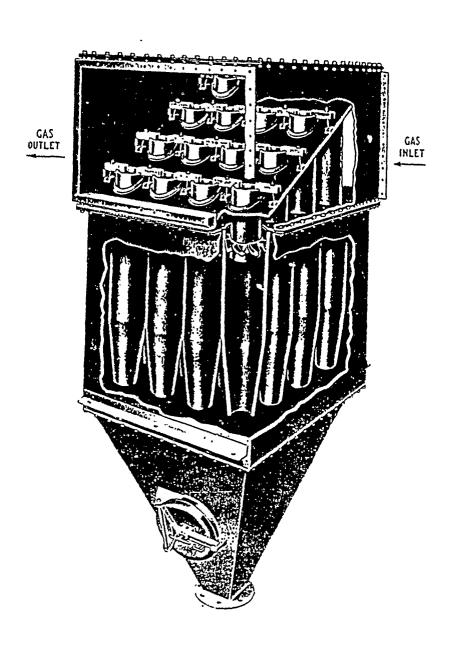


Figure 2. Schematic of Cyclone Separator

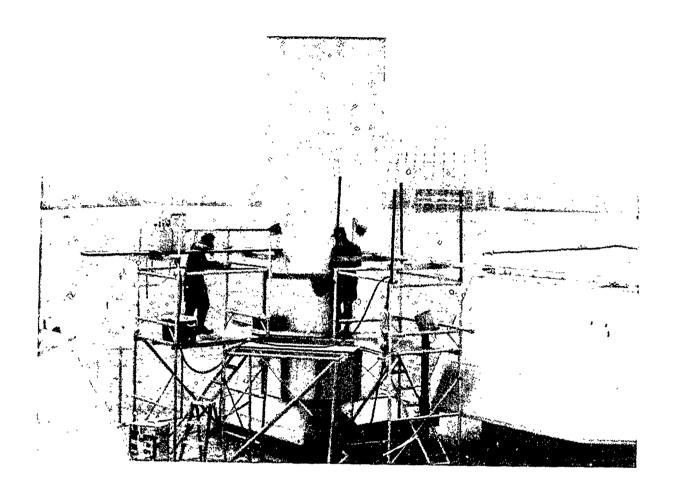


Figure 3. Exhaust Stack of Boiler 1

C. Applicable Standards

The source testing regulations are defined under 18 AAC 50.050(a), 50.050(b), and 50.500. These regulations are found in Appendix C and reiterated below.

1. Visible Emissions (18 AAC 50.050(a))

Visible emissions, excluding condensed water vapor from an industrial process or fuel burning equipment, may not reduce visiblity through the exhaust effluent by greater than 20% for a total of more than three minutes in any one hour.

2. Particulate Emissions (18 AAC 50.050(b))

Particulate emissions may not exceed, per cubic foot of exhaust gas corrected to standard conditions, 0.1 grains per dry standard cubic foot (gdscf) for steam generating plants burning as fuel: (1) coal, and in operation before July 1, 1972 or (2) coal, and rated less than 250 million Btu per hour heat input.

D. Sampling Methods and Procedures

Particulate emissions testing was conducted in accordance with EPA method 5, found in 40 CFR 60, Appendix A as dictated by 18 AAC 500 and Permit No. 8731-AA004. Testing requires three 1-hour (minimum) sample runs; the results of which are averaged for a final emission rate. Boiler 1 was tested as a representative boiler.

Sampling ports existed in the stack 10.0 feet downstream and 15.5 feet upstream from any flow disturbance. With an inside diameter of 6.9 feet, sampling sites were greater than one-half duct diameter downstream and two duct diameters upstream from any flow disturbance. Based on this information and the type of sample (particulate), 24 traverse points (12 per diameter) were used to collect a representative particulate sample.

Prior to the sample run on the stack, cyclonic flow was determined by using the type S pitot tube and measuring the stack gas rotational angle at each traverse point. Flow conditions are considered acceptable when the arithmetic mean average of the rotational angles is 20 degrees or less. These conditions were not met and a straightening vane was installed in the stack to correct the flow. Cyclonic flow determination was reaccomplished and was within acceptable limits. A preliminary velocity pressure traverse was also accomplished before each sample run.

A grab sample for ORSAT analysis (measures oxygen (0_2) and $C0_2$ for stack gas molecular weight determination) was taken during each sample run. ORSAT sampling and analysis equipment are shown in Figures 4 and 5. Flue gas moisture content, needed for determination of flue gas molecular weight, was obtained during particulate sampling.

Particulate samples were collected using the sampling train shown in Figure 6. The train consisted of a button-hook probe nozzle, heated stainless steel-lined probe, heated glass filter, impingers and a pumping and metering device. The probe nozzle was sized prior to the sample run so that the gas stream could be sampled isokinetically, (i.e., the velocity at the nozzle tip was the same as the stack gas velocity at each point sampled). Flue gas velocity pressure was measured at the nozzle tip using a Type S pitot tube connected to a 10-inch inclined-vertical manometer. Type K thermocouples were used to measure flue gas as well as sampling train temperatures. The probe liner was heated to minimize moisture condensation. The heated filter was used to collect particulates. The impinger train (first, third, and fourth impingers: modified Greenburg-Smith type, second impinger: standard Greenburg-Smith design) was used as a condenser to collect stack gas moisture. The pumping and metering system was used to control and monitor the sample gas flow rate.

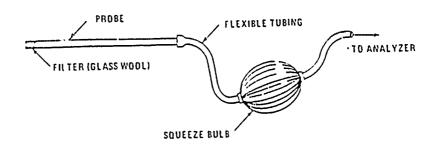
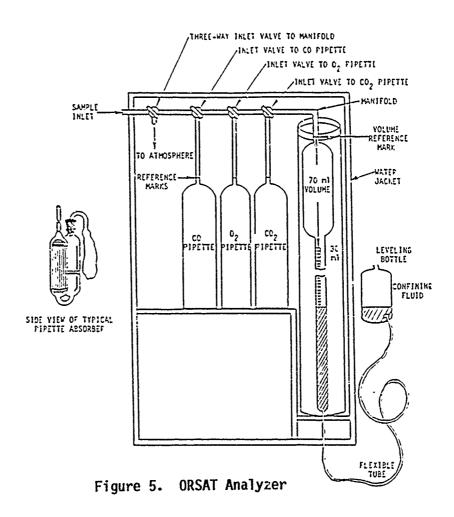


Figure 4. ORSAT Sampling Train



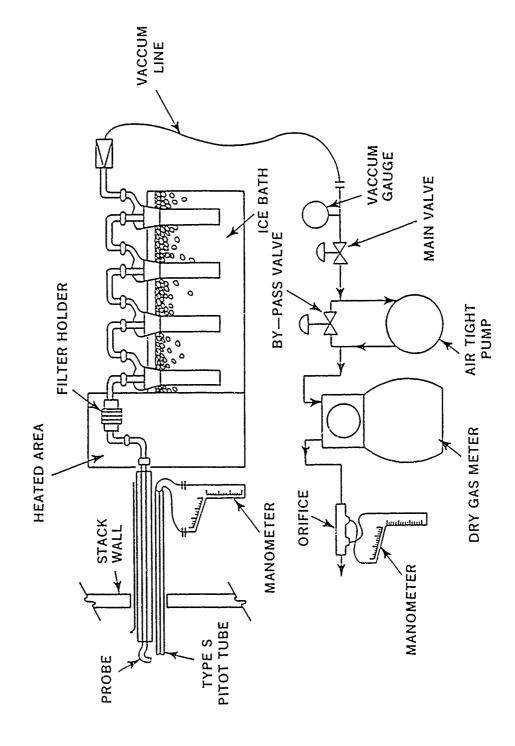


Figure 6. Particulate Sampling Train

Testing was accomplished on Boiler 1 at steam output capacities of 90,000 lbs/hr (20 and 21 Jun 89) and 80,000 lbs/hr (22 Jun 89). Power plant operating logs for 20, 21, 22 June are included in Appendix D. Complete EPA Method 5 and Method 9 (visible emissions) evaluations were conducted at each rated output. Field data, including visible emissions, for each test are presented in Appendixes E, F, and G, respectively. Method 9 determinations for opacity during this project were accomplished by a certified team member. EPA Method 9 certification documentation is provided in Appendix H.

Particulate samples were analyzed according to the procedures specified in Method 5. Emission calculations were accomplished using the "Source Test Calculation and Check Programs for Hewlett-Packard 41 Calculators" (EPA-340/1-85-018) developed by the EPA Office of Air Quality Planning and Standards, Research Triangle Park NC. Resulting emission calculations are presented in Appendix I. Equipment calibration data are presented in Appendix J.

III. CONCLUSIONS

The Table provides operating parameters and emission test results for Boiler 1 of the Clear AFS Power Plant. Boiler 1 did not meet state standards for particulate emissions while operating at 90,000 lbs steam/hr on either 20 or 21 June. The boiler met state standards for visible emissions for all runs on both days.

Stack Emission Test Results

Date	Boiler Operating Capacity (lbs steam/hr)	Run No.	Scot Blow	Particulate Emissions (gr/dscf)*
20 Jun	90,000	1 2 3	XX	0.1643 0.1580 0.1953
				AVG = 0.1725
21 Jun	90,000	1 2 3	XX	0.0792 0.1339 0.1909
				$AVG = \overline{0.1347}$
22 Jun	80,000	1 2 3	XX	0.1081 0.0982 0.0869
				AVG = 0.0977

^{*} gr/dscf = grains per dry standard cubic foot

Subsequently, the operating capacity was lowered to 80,000 lbs steam/hr and tested again on 22 June. Boiler 1 had particulate emissions of 0.109, 0.098, and 0.085 gr/dscf, for an average of 0.100 gr/dscf. Percent isokinetics for the three runs were 99.88, 100.58, and 101.94, respectively. Results indicate that the Clear AFS Power Plant is in compliance with applicable Alaska DEC visible and particulate emissions regulations. Accordingly, Alaska DEC Permit to Operate No. 8731-AA004 will limit the operation of each boiler at or below an output capacity of 80,000 lbs steam/hr.

IV. RECOMMENDATION

AFOEHL will remain active in providing Clear AFS with consultative and field support with regards to their Power Plant.

References

- 1. Code of Federal Regulations. Vol 40, Parts 53-60, The Office of the Federal Register National Archives and Records Service, General Services Administration, Washington DC, July 1987.
- 2. Quality Assurance Handbook for Air Pollution Measurement Systems Volume III, Stationary Source Specific Methods, U.S. Environmental Protection Agency, EPA-600/4-77-027-b, Research Triangle Park, North Carolina, December 1984.
- 3. Source Test Calculation and Check Programs for Hewlett-Packard 41 Calculators, U.S. Environmental Protection Agency, EPA-340/1-85-018, Research Triangle Park, North Carolina, May 1987.

APPENDIX A

Personnel

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1. AFOEHL Test Team

Maj James A. Garrison, Chief, Air Quality Function Capt Paul T. Scott, Consultant, Air Quality Meteorologist Capt Ronald Vaughn, Consultant, Air Quality Engineer 1Lt Charles Attebery, Consultant, Environmental Engineer Sgt Robert P. Davis, Environmental Quality Technician

AFOEHL/EQE Brooks AFB TX 78235-5501 AV 240-2891 COM (512)536-2891

2. Clear AFS Power Plant Personnel

Wendell Shoemaker Larry Wegener 13 MWS/DEMU 13 MWS/DEMU AV 317-585-6237

3. Eielson AFB Support Personel

SSgt John Willey

343 Medical Group/SGPB AV 317-377-5225 COM (907)377-5225

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APPENDIX B

Permit to Operate No. 8731-AA004

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DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY CONTROL

PERMIT TO OPERATE

Permit No.8731-AA004

Date of Issue: APRIL 3, 1987

The Department of Environmental Conservation, under the authority of AS 46.03 and 18 AAC 50.400, issues an Air Quality Control Permit to Operate to:

U.S. Air Force 13th Missile Warning Squadron APO Seattle, Washington 98704

for the operation of the Clear Air Force Station power and heating plant, consisting of three 177 MM BTU/hr coal-fired boilers and 14 diesel-fired boilers, as described in the OMB Form 158-R75, dated April 26, 1977, submitted by HQ ADCOM/DEMUS, Peterson AFB, Colorado, and Air Quality Control Permit application dated March 24, 1978, renewal request dated February 9, 1983, and modification request dated February 3, 1987.

Located at the Clear Missile Early Warning Station, Clear, Alaska.

Under the conditions:

- 1. Permittee shall comply with the State Ambient Air Quality Standards established in 18 AAC 50.020 and the applicable emissions standards specified in Air Control Regulations 18 AAC 50.050.
- 2. An Air Contaminant Emission Report, as described in Exhibit A, shall be submitted to the Northern Regional Office, Department of Environmental Conservation, P. O. Box 1601, Fairbanks, Alaska 99707, (907) 452-1714, semiannually by January 30 and July 30 of each year.
- 3. Permittee shall maintain and operate all fuel burning equipment, emission control devices, processes and monitoring equipment to provide optimum air quality control during all operating periods.
- 4. Permittee shall maintain test results, monitoring instrument recorder charts and other applicable data in an active file for one year and have them available on request for not less than three years.
- 5. The department's representatives shall be allowed access to permittee's facilities to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, state environmental laws and regulations.

- 6. If waste oil is used as a fuel, the maximum amount that can be burned is 1,000 gallons per month. The waste oil must not be atomized into the combustion chamber. A composite sample of the waste oil must be taken once each year and analyzed as described in Exhibit A. Tests for other components may be required if deemed necessary to ascertain compliance with applicable standards. Waste oil shall not be burned when the plume is directly impacting adjacent populated areas.
- 7. Before January 30, 1990, the permittee shall conduct particulate matter source tests in conformance with 40 CFR 60.8 and 40 CFR 60, Appendix A, to certify compliance with 18 AAC 50.050(b)(2). Tests for other components may be required if deemed necessary to ascertain compliance with applicable standards. The test report shall be submitted within 45 days and shall be in the format set by Appendix IV-3 of the State Air Quality Control plan. The maximum boiler firing rate shall be limited to the highest rate at which the boiler met emission standard 18 AAC 50.050(b)(2).
- 8. A copy of this permit shall be cleary displayed and the State Air Quality Control Regulations 18 AAC 50 kept on file at the permitted location.

This permit expires on <u>January 30</u>, 1990, and may be revoked or suspended in accordance with 18 AAC 50.310.

Larry Dietrick

Regional Environmental Supervisor

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EXHIBIT A

AIR QUALITY CONTROL PERMIT TO OPERATE No. 8731-AA004 AIR CONTAMINANT EMISSION REPORT

An Air Contaminant Emission Report shall be submitted to the Northern Regional Office, P. O. Box 1601. Fairbanks, Alaska 99707, semiannually by-January 30 and July 30 of each year. The report shall include, but not be limited to, the following information:

NAME OF FIRM LOCATION OF FACILITIES PERIOD OF REPORT

		Quarterly Total			
1.	Days Operated	Number of hours or days per unit			
	BLR-1-177 BLR-2-177 BLR-3-177				
	Diesel boilers (various)	Numbers of hours or days for all diesel boilers			
		(It is not necessary to report individual diesel boilers)			
2.	Fuel Consumption	Tons coal per unit and gallons oil per unit (type of oil burned)			
	Coal burners Oil burners	(type of oil durned)			

BLR = Coal or oil-fired boiler. BTUx10⁶ rating indicated.

3. Attach a detailed description of equipment or operating conditions which may adversely affect air contaminant emissions. A preliminary report of the incident shall be submitted to the department within five working days of the incident by calling or writing to the Northern Regional Office, P. O. Box 1601, Fairbanks, Alaska 99707, (907) 452-1714. Include such information as: date of incident; duration; nature of the occurrence; equipment failures; steps taken to minimize emissions; measures taken to avoid recurrence; and a general description of the weather. A separate report is required for each incident.

- 4. Attach a cabulation of estimated weekly average opacity (ansmissivity) for each of the coal-fired boilers, based on data recorded by continuous monitors if installed.
- 5. Attach one yearly composite chemical analysis of the waste oil burned. The analysis shall list the concentration of: arsenic, lead, cadmium, chromium, PCB's, sulfur, and total halogens.
- 6. Attach a brief discussion of any change in monitoring equipment or failure which may affect reported results or yield incomplete data for any given day.
- 7. Signature of authorized agent preceded by the statement: "I am familiar with the information contained in this report and that, to the best of my knowledge and belief, such information is true, complete, and accurate."

Appendix C
State Regulations

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ALASKA AIR QUALITY CONTROL REGULATIONS

(Alaska Administrative Code, Title 18, Environmental Conservation, Chapter 50 — Air Quality Control; Effective May 26, 1972; Amended November 9, 1972; May 8, 1974; May 4, 1980; November 1, 1982; October 30, 1983; June 7, 1987)

ARTICLE 1. PROGRAM STANDARDS AND LIMITATIONS

50.010. APPLICABILITY OF LOCAL GOVERNMENT REGULATIONS. A local air quality control agency may establish the same or more stringent regulations, but not less stringent regulations, as the applicable regulations specified in this chapter.

50.020. AMBIENT AIR QUALITY STANDARDS. (a) The concentration of contaminants in the ambient air, corrected to standard conditions, may not exceed the following:

- (1) suspended particulate matter -
- (A) annual geometric mean of 60 micrograms per cubic meter; or
- (B) 24-hour average of 150 micrograms per cubic meter more than once each year;
- (2) sulfur oxides, measured as sulfur dioxide —
- (A) annual arithmetic mean of 80 micrograms per cubic meter;
- (B) 24-hour average of 365 micrograms per cubic meter more than once each year;
- (C) three-hour average of 1300 micrograms per cubic meter more than once each year;
 - (3) carbon monoxide —
- (A) eight-hour average of 10 milligrams per cubic meter more than once each year; or
- (B) one-hour average of 40 milligrams per cubic meter more than once each year;
- (4) ozone one-hour average of 235 micrograms per cubic meter expected more than once per year;

- (5) nitrogen dioxide annual arithmetic mean of 100 micrograms per cubic meter;
- (6) reduced sulfur compounds, expressed as sulfur dioxide 30-minute average of 50 micrograms per cubic meter more than once each year; and
- (7) lead quarterly arithmetic mean of 1.5 micrograms per cubic meter.
- (b) In areas where concentrations of contaminants in the ambient air are less than the standards set out in (a) of this section, the concentrations must be kept below those standards, and no increase above the baseline concentration may exceed
 - (1) for a Class I area
 - (A) suspended particulate matter —
- (i) annual geometric mean of five micrograms per cubic meter; or
- (ii) 24-hour average of 10 micrograms per cubic meter more than once each year; and
- (B) sulfur dioxide -
- (i) annual arithmetic mean of two micrograms per cubic meter;
- (ii) 24-hour average of five micrograms per cubic meter more than once each year; or
- (iii) three-hour maximum of 25 micrograms per cubic meter more than once each year;
 - (2) for a Class II area
 - (A) particulate matter -
- (i) annual geometric mean of 19 micrograms per cubic meter, or
- (ii) 24-hour average of 37 micrograms per cubic meter more than once each year; and
 - (B) sulfur dioxide -
 - (i) annual arithmetic mean of 20 micro-

grams per cubic meter.

- (ii) 24-hour average of 91 micrograms per cubic meter more than once each year; or
- (iii) three-hour average of 512 micrograms per cubic meter more than once each year;
 - (3) for a Class III area
 - (A) particulate matter
- (i) annual geometric mean of 37 micrograms per cubic meter; or
- (ii) 24-hour average of 75 micrograms per cubic meter more than once each year, and
 - (B) sulfur dioxide
- (i) annual arithmetic mean of 40 micrograms per cubic meter;
- (ii) 24-hour average of 182 micrograms per cubic meter more than once each year;
- (iii) three-hour average of 700 micrograms per cubic meter more than once each year.

50.021. STATE AIR QUALITY CLAS-SIFICATIONS. (a) For purposes of classifying areas according to air quality, those areas in nonattainment with the ambient air quality standards of this chapter are

- (1) Anchorage urban area for carbon monoxide; and
- (2) Fairbanks and North Pole urban areas for carbon monoxide.
- (b) For purposes of the ambient air quality standards specified in 18 AAC 50.020(b)
 - (1) Class I areas in the state are
- (A) Denali (Mt. McKinley) National Park;
- (B) that portion of Bering Sea National Wildlife Refuge designated as a National Wilderness Area;

- (C) that portion of Simeonof National Wildlife Refuge designated as a National Wilderness Area; and
- (D) that portion of Tuxedni National Wildlife Refuge designated as a National Wilderness Area:
- (2) those areas of the state not classified in (a) of this section, or (1) or (3) of this subsection are classified as Class II; and

(3) no areas in the state have been classified as Class-III.

(c) For purposes of preventing impairment of visibility, the designated areas are

(1) Mt. Deborah and the Alaska Range East, as viewed from approximately the Savage River Campground area;

(2) Mt. McKinley, Alaska Range, and the Interior Lowlands, as viewed from the vicinity of Wonder Lake; and

(3) the Class I areas listed in (b)(1) of this-section.

(d) For purposes of maintaining the ambient air quality standards set out in 18 AAC 50.020(a), the Mendenhall Valley of Juneau is a wood smoke control area.

50.030. OPEN BURNING. (a) Open burning ust achieve maximum combustion efficiency throughout the burning period, and is subject to the exception in (e) of this section, the limitations in (b), (c), (d), and (f) of this section, and 18 AAC 50.110.

- (b) Open burning of asphalts, rubber products, plastics, tars, oils, oily wastes, contaminated oil cleanup materials, or other materials in a way that gives off black smoke is prohibited without written approval from the department Approved open burning is subject to the following limitations:
- (1) controlled fires for training fire fighters must be advertised through news media in the general area of the activity at least three days before the activity, informing the public of the time, place, and purpose of the fire, unless waived by the department,
- (2) open burning of liquid hydrocarbons produced during oil or gas well flow tests will be approved only if there are no practical means available to recycle, reuse, or dispose of the fluids in a more environmentally acceptable way; and

- (3) reasonable procedures and requirements must be established by the person doing the burning to minimize adverse environment effects and limit the amount of smoke generated.
- (c) Open burning or incineration of pesticides, halogenated organic compounds, cyanic compounds, or polyurethane products in a way that gives off toxic or acidic gases or particulate matter is prohibted.
- (d) Open burning of putrescible garbage, animal carcasses, or petroleum-based materials is prohibited if it causes order or black smoke which has an adverse effect on nearby persons or residences.
- (e) Controlled burning for the management of forest land, vegetative cover, fisheries, or wildlife habitat, other than burning to combat a natural wildfire, requires written approval from the department.
- (f) Open burning is prohibited in an area if an air quality advisory by the department is broadcast on radio or television stating that burning is not permitted in that area for that day. This advisory will be based on a determination that there is or is likely to be inadequate air ventilation to maintain the standards set by 18 AAC 50.020.
- (g) Open burning is prohibited in wood smoke control areas identified in 18 AAC 50.021(d) between November 1 and March 31.

50.040. INCINERATORS. (a) Visible emissions, excluding condensed water vapor, from an incinerator may not reduce visibility through the exhaust effluent by

- (1) greater than 20 percent-for a-total of more than three minutes in any one hour, except as provided in (2) of this subsection; or
- (2) 20 percent or greater for municipal wastewater treatment plant sludge incinerators.
- (b) Emissions of particulate matter from incinerators may not exceed, per cubic foot of exhaust gas corrected to 12 percent CO₂ and standard conditions, and except as specified in (c) of this section

(1) 0.15 grains for incinerators less than 2,000 pounds, but greater than or equal to 1,000 pounds per hour rated capacity, or

(2) 0.08 grains from incinerators of 2,000 pounds per hour rated capacity or larger.

(c) Emissions of particulate matter from municipal wastewater treatment plant sludge incinerators which serve 10,000 or more persons and burn waste containing more than 10 percent wastewater treatment plant sludge by dry weight, may not exceed 0.65 grams per kilogram of dry sludge input.

50.050 INDUSTRIAL PROCESSES AND FUEL BURNING EQUIPMENT.
(a) Visible emissions, excluding condensed water vapor, from an industrial process or fuel burning equipment may not reduce visibility through the exhaust effluent by

(1) greater than 20 percent for a total of more than three minutes in any one hour, except as noted in (2) — (8) of this subsection:

subsection;

(2) greater than 30 percent for more than three minutes in any one hour for fuel burning equipment in operation before November 1, 1982 and using more than 20 percent woodwaste as fuel;

(3) greater than 30 percent for urea prilling towers in operation before July 1, 1972, for a total of more than three min-

utes in any one hour;

- (4) 20 percent or greater for asphalt plants installed or modified after November 1, 1982;
- (5) 20 percent or greater for process emissions, other than from pneumatic cleaners, at coal preparation facilities installed or modified after November 1, 1982;
- (6) 10 percent or greater for pneumatic cleaners at coal preparation facilities installed or modified after November 1, 1982:
- (7) 10 percent or greater for process emissions, other than from kilns, at portland cement plants installed or modified after November 1, 1982; and
- (8) 20 percent or greater for kilns at portland cement plants installed or modified after November 1, 1982.
- (b) Particulate matter emitted from industrial processes or fuel burning equipment may not exceed, per cubic foot of exhaust gas corrected to standard conditions
- (1)-0.05 grains except as provided in (2) (4) of this subsection, (d) of this section, and 18 AAC 50.060;
- (2) 0.1 grains for steam generating plants burning as fuel

- (A) coal, and in operation before July 1, fuel gas and other fuels to the total fuel 1972:
- (B) coal, and rated less than 250 million Btu per hour heat-input; or
 - (C) municipal wastes:
- (3) 0 1 grains for an industrial process in operation before July 1, 1972; or
- (4) 0.15 grains from fuel burning equipment in operation before November 1, 1982, and using more than 20 percent woodwastes as fuel.
- (c) Sulfur compound emissions, expressed as sulfur diexide, from an industrial processs or from fuel burning equipment may not exceed 500 ppm averaged over a period of three hours, except as provided in (d) of this section, and 18 AAC 50.060.
- (d) Emissions from a source installed or modified after November 1, 1982 may not
- (1) at asphalt plants, 90 milligrams of narticulate matter per cubic meter of exhaust gas at standard conditions;
 - (2) at petroleum refineries
- (A) catalytic cracking unit catalyst regenerator
- (i) 1.0 kilogram of particulate matter per 1,000 kilograms of coke-burnoff,
- (11) 43.0 additional grams of particulate matter per million joules supplemental heat attributable to fuels burned in a catalyst regenerator waste heat boiler; and
- (iii) 500-ppm carbon monoxide by-volume of exhaust-gas;
- (B)-suflur recovery plant-rated at-more than 20 long tons per day
- (i) 250 ppm sulfur dioxide at zero percent oxygen-on a dry basis; or
- (ii) 10 ppm hydrogen sulfide and a total of 300 ppm reduced sulfur compounds, expressed as sulfur dioxide, at zero percent oxygen on a dry basis, if the air contaminants are not oxidized before release to the atmosphere; and
- (C) fuel burning equipment, sulfur dioxide averaged over three hours
- (i) equal to the concentration of uncontrolled emissions which would result from burning fuel gas containing 230 milligrams hydrogen sulfide per dry standard cubic meter from equipment burning fuel
- (ii) a calculated concentration based on the allowable-emissions in (i) and (iii) of this subparagraph and the proportion of

- burned in fuel burning equipment; or
- (iii) 500 ppm from all other fuel burning equipment:
 - (3) at coal preparation facilities
- (A) thermal drying unit, 70 milligrams of particulate matter per cubic meter of exhaust gas at standard conditions; and
- (B) pneumatic coal cleaning unit, 40 milligrams of particulate matter per cubic meter of exhaust gas at standard conditions; and
- (4) at portland cement plants
- (A) clinker cooler, 0.050 kilograms of particulate matter per 1000 kilograms of feed on a dry basis to the kiln; and
- (B) kiln, 0.15 kilograms of particulate matter per 1000 kilograms of feed on a dry basis.
- (e) Release of materials other than process emissions, products of combustion, or materials introduced to control pollutant emissions from a stack at a source built or modified after November 1, 1982 is prohibited unless approved in writing by the department.
- (f) No person may cause or permit bulk materials to be handled, transported, or stored, or engage in an industrial activity or construction project without taking reasonable precautions to prevent particulate matter from becoming airborne.
- 50.060. PULP MILLS. Average emissions per ton of pulp produced from a sulfite pulp mill-may-not exceed in-any-24hour period
- (1) 20 pounds of sulfur oxides (expressed as sulfur dioxide) from blow pits. washer vents, storage tanks, digester-relief systems, and recovery systems; and
- (2) two pounds of particulate matter from blow pits, washer vents, storage tanks, digester relief systems, and recovery
- 50.070. MOTOR VEHICLE EMISSIONS. (a) Emissions from gasoline-powered motor vehicles, excluding condensed water vapor, may not be visible for more than any five consecutive
- (b) Visible emissions from dieselpowered motor vehicles, excluding condensed water vapor, may not result in a reduction of visibility of greater than 40 percent through the exhaust effluent for more than any five consecutive seconds.

50.080. [Repealed]

50.085. WOOD-FIRED HEATING DEVICES. For wood-fired heating devices.

- (1) when an air quality alert is issued. under 18 AAC 50.610(a)(1)(B) for particulate matter within a specific area, except areas set out in (3) of this section, visible emissions at the point of release to the atmosphere may not reduce visibility through the exhaust effluent by 50 percent or greater for more than 15 minutes in any one hour:
- (2) burning in a way that creates black smoke is prohibited; and
- (3) for wood smoke control areas identified in 18 AAC 50.021(d)
- (A) visible emissions at the point of release to the atmosphere may not reduce visibility through the exhaust effluent by 50 percent or greater for more than 15 minutes in any one hour; and
- (B) when an air emergency has been issued under 18 AAC 50.610 (a)(3)(D), no person may operate, permit, or allow the operation of a wood-fired heating device which results in the emission of
- 50.090. ICE FOG LIMITATIONS. The department will, in its discretion, require any person proposing to build or operate an industrial process, fuel burning equipment or incinerator in areas of potential-ice fog, to obtain a permit to operate and to reduce water emissions.
- 50.100. MARINE VESSELS. Within three miles of the coastline of Alaska, visible emissions from any marine vessel, excluding condensed water vapor, may not result in a reduction of visibility through the exhaust effluent of greater than
- (1) 40 percent for a period or periods aggregating more than three minutes in any one-hour, except as provided in (2) of this section; and
- (2) 40 percent for a period or periods aggregating more than six minutes in any one hour during initial startup of dieseldriven vessels.
- 50.110. AIR POLLUTION PROHIBITED. No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.

50.120 - 50.190. [Repealed]

ARTICLE 2. PERMIT REQUIREMENTS

50,300. PERMIT TO OPERATE. (a) No person may construct, modify, reconstuct, operate, or cause the operation of the following without a permit from the department:

(1) a facility containing a source which requires an air contaminant emission control unit or system to comply with emission standards set by 18 AAC 50.040—18 AAC 50.060, and which is

(A) an industrial process with a total design rate, capacity, or throughput greater than five tons per hour and which physically or chemically treats the material: or

(B) fuel-burning equipment with a rating of 50 million Btu per hour or greater;

(2) fuel-burning equipment with a rating of 100 million Btu per hour or more;

(3) an incinerator with a rated capacity of 1,000 pounds per hour or more;

- (4) a facility subject to the standards set by 18 AAC 50.040(c), 18 AAC 50.050(a)(5), 18 AAC 50.050(a)(7), or 18 AAC 50.050(d):
 - (5)-a facility
- (A) which has allowable emissions of 100 tons per year or more of an air contaminant regulated under the Clean Air Act (P.L. 91-604) as amended August 7, 1977 (P.L. 95-95), is installed after November 1, 1982, and is a
- (i) fossil fuel fired steam electric plant of more than 250 million Btu's per hour heat input;
- (ii) coal cleaning plant (with thermal dryers);
 - (iii) krast pulp mill;
 - (iv) portland cement plant;
 - (v) primary zinc smelter;
 - (vi) iron and steel mill plant;
- (vii) primary aluminum ore reduction plant;
- (viii) primary copper smelter;
- (ix) municipal incinerator capable of charging more than 250 tons of refuse per day:
- (x)-hydrofluoric, sulfuric, or nitric acid plant;
 - (x1) petroleum refinery,
 - (xii) lime plant;
 - (xiii) phosphate rock processing plant,
 - (xiv)-coke oven-battery,
 - (xv) sulfur recovery plant,

- (xvi) carbon black plant (furnace process);
 - (xvii) primary lead smelter;
 - (xviii) fuel conversion plant;
 - (xix) sintering plant:
 - (xx) secondary metal production plant;
 - (xxi) chemical process plant;
- (xxii) fossil fuel boiler or a combination of boilers totaling more than 250 million Btu's per hour heat input;

(xxiii) petroleum storage and transfer unit with a total storage capacity exceeding 300,000 barrels;

- (xxiv) taconite ore processing plant;
- (xxv) glass fiber processing plant; or (xxvi) charcoal production plant;
- (B) which is listed in (A) of this paragraph with allowable emissions of less than 100 tons per year of a regulated air contaminant and is modified after August 7, 1977, causing an increase in allowable emissions of 100 tons per year or more; or
- (C) which is listed in (A) of this paragraph with allowable emissions of greater than 100 tons per year of a regulated air contaminant and is modified after August 7, 1980, or after the date of the most recent permit-issued for the affected area under 18 AAC 50.400(c)(3), causing an exceeding the emissions listed in (6)(C)(i), - (xvii) of this subsection;
- (6) a facility not listed in (5) of this subsection
- (A) which has allowable emissions of 250-tons-per year or more of an air-contaminant regulated under the Clean Air Act (P.L. 91-604) as amended August 7, 1977 (P.L. 95-95), and is installed after November 1, 1982;
- (B) which has allowable emissions of less than 250 tons per year of a regulated air contaminant and is modified after August 7, 1977, causing an increase in allowable emissions of 250-tons-per-year-or more; or
- (C) which has allowable emissions of more than 250 tons per year of a regulated air contaminant and is modified after August 7, 1980, or after the date of the most recent permit issued for the affected area under 18 AAC 50.400(c)(3), causing an increase in actual emissions equal to exceeding any of the following:
 - (1) carbon monoxide 100 tpy;
 - (ii) nitrogen oxides 40-tpy;
 - (iii) sulfui dioxide 40 tpy;

- (iv) particulate matter 25 tpy;
- (v) ozone 40 tpy of volatile organic compounds as an ozone indicator;
 - (vi) lead 0.6 tpy;
 - (vii) asbestos 0.007 tpy;
 - (viii) beryllium 0.0004 tpy;
 - (ix) mercury 0.1 tpy; (x) vinyl chloride - 1 tpv:
 - (xi) fluorides 3 tpy;
 - (xii) sulfuric acid mist 7 tpy;
 - (xiii) hydrogen sulfide (H,S) 10 tpy; (xiv) total reduced sulfur including H,S - 10 tpy:
- (xv) reduced sulfur compounds including H₂S — 10 tpv:
- (xvi) increased emissions of a pollutant regulated by the Clean Air Act (PL 91-604) as amended August 7, 1977 (PL 95-95) and not listed in (6)(C)(i)-(xv) of this subsection; or
- (xvii) notwithstanding (i) through (xvi). if located within 10 kilometers of an area listed in 18 AAC 50.021(b)(1) with increased emissions that impact the area by 1 ug/m³ or more for a 24-hour average;
- (7) a source or facility installed, reconstructed, or modified after July 1, 1979 or after the date of the most recent permit issued since November 1, 1982, under 18 increase in actual emissions equal to or AAC 50.400(c)(4), located within an area identified in 18 AAC 50.021(a), and causing an increase in actual or allowable carbon monoxide emissions, whichever is greater, from the source or facility of 100 tons per year or more; or
 - (8) a facility or modification to a facility for which the owner or operator has requested that the department approve limitations of emission rates or operations to-reduce emissions to levels below those specified in this chapter.
 - (b) An application for a permit required by (a) of this section must include
 - (1) one set of plans and specifications clearly showing the layout of the proposed facility, location of individual equipment and points of discharge, building dimensions, and stack heights;
 - (2) a map or aerial photograph, on a scale at least-one inch to one mile indicating the location of the proposed facility, homes, buildings, roads, and other adiacent facilities, and the general topography within 15 kilometers of the facility;
 - (3) an engineering report outlining the proposed methods of operation, the

amount of material to be processed, the proposed use and distribution of the processed material, and a process flow diagram with description showing points of emission and estimated amounts and types of air contaminants to be emitted;

(4) a description of air quality control devices, including efficiency and other design criteria, and assurances that this equipment is capable of complying with applicable emission requirements specified in this chapter:

(5) if requested by the department, an evaluation of the effect of the facility's expected maximum emissions on the ambient air, including ambient air quality and meterorological data;

(6) if requested by the department, plans for emission reduction procedures to be used during an air episode; and

(7) a detailed schedule for construction or modification of the facility.

- (c) A permit application for a facility subject to (a)(5) or (a)(6) of this section must include the following information in addition to that required under (b) of this section:
- (1) ambient air and meteorological data to fully describe the air quality in the vicinity of the proposed facility and any changes in air quality due to general growth which has occurred after the establishment of the baseline date in the area the facility or modification would affect; department approval of the air monitoring network is required before starting data collection;
- (2) a detailed demonstration that the expected maximum emissions from the construction and operation of the facility, including emissions from associated growth, will not cause a violation, or contribute to an existing violation, of the ambient air quality standards in 18 AAC 50.020(a) or allowable increments in 18 AAC 50.020(b);
- (3) an adequate demonstration that the proposed emission control system represents the best available control technology for each air contaminant and for each new or modified source; and
- (4) an analysis of the impact of expected maximum emissions from the facility,

including emissions from associated growth, on visibility, vegetation, and soils.

- (d) A permit application for a facility subject to (a)(7) of this section must include the following information in addition to that required under (b) of this section:
- (1) proof that emissions of a pollutant for which the area is declared in nonattainment will not exceed the applicable emission allowance, and will be controlled to a rate which represents the lowest achievable emission rate; and
- (2) proof that other sources owned or operated by the applicant within the state are in compliance with the requirements of this chapter and the Clean Air Act (P.L. 91-604) as amended August 7, 1977 (P.L. 95-95).
- (e) A permit application submitted under (a)(8) of this section need not include the information required under (b) and (c) of this section, but must specify the limitations on emission rates or operations necessary to exempt the facility from 18 AAC 50.300(a)(5) (7) or any other requirement of this chapter.
- (f) If a permit application is deficient, the department will notify the applicant by certified mail within 30 days after receipt of the application, identifying the deficiencies and the information to be submitted. When the deficiencies are corrected, the department will continue processing the application.

50.310. REVOCATION OR SUSPEN-SION OF PERMIT. A permit to operate will, in the department's discretion, be revoked or suspended if the conditions of the permit or applicable laws or regulations are violated.

ARTICLE 3. PERMIT REVIEW-CRITERIA

50.400. APPLICATION REVIEW AND ISSUANCE OF PERMIT TO OPERATE. (a) Before review under (b) of this section for a facility described in 18 AAC 50.300(a)(5), (6), or (7); for a facility with a stack described in 18 AAC 50.900(23)(C); or for any other facility for which the department finds that additional public review and comment is desirable, an opportunity for public comment and

hearing will be provided using the following procedures:

- (1) at least 30 days before beginning review under (b) of this section a summary of the department's preliminary review and analysis of the application will be published in a newspaper of general circulation within the area where the new or modified facility is to be located. The analysis will be sent to the Environmental Protection Agency, and any federal land manager, Indian governing body on a reservation, or unit of local government which may be affected by emissions from the proposed activity; materials submitted by the applicant and a copy of the proposed permit will be available in at least one location within the area of the new or modified facility;
- (2) the department, upon its own motion, or upon request, will hold a public hearing on the application following the procedures set out in 18 AAC 15.060(d)—(g); 60 days notice of a hearing will be sent to any affected federal land manager under 18 AAC 50.021(c); and
- (3) public comments and testimony received on the application will be evaluated as part of the information needed to complete evaluation of the permit application, and will be made available to the public.
- (b) The department will review a permit application and will, in its discretion, issue the permit within 30 days after receipt of all information needed to complete evaluation of the application, including testimony at a public hearing held under (a) of this section. For applications subject to (a) of this section, a copy of the final determination will be published and distributed as described in (a)(1) of this section.
- (c) The department will issue a permit only if the applicant shows that
- (1) allowable emissions from the facility and from associated growth will not prevent or interfere with the attainment or maintenance of ambient air quality standards set by 18 AAC 50.020(a);
- (2) air contaminant emissions from a source in the facility will not exceed the requirements of 18 AAC 50.040 18 AAC 50.060 and 18 AAC 50.110 and are approvable by the Environmental Protec-

tion Agency under the federal new source performance standards or emission standards for hazardous air pollutants;

(3) for a facility subject to 18 AAC

50.300(a)(5) or (6),

(A) the best available control technology for controlling emissions of each pollutant will be installed and used for each new or modified source;

- (B) in an area designated in 18 AAC 50.021(b) as in attainment with ambient air quality standards set by 18 AAC 50.020(a), allowable emissions from the facility and from associated growth will not
- (i) cause or contribute to an increase in air contaminants greater than specified in 18 AAC 50.020(b); or
- (ii) cause an increase of carbon monoxide more than 500 ug/m' eight-hour average or 2000 ug/m' one-hour average within any area specified in 18 AAC 50.021(a); and
- (C) allowable emissions from the facility and from associated growth will not adversely affect air quality related values, including noise, odor, visibility, vegetation, and soils of any area within the state; and

(4) for a facility subject to 18 AAC

50.300(a)(7).

- (A) emissions will not exceed the emission allowance in the applicable nonattainment area;
- (B) the lowest achievable emission rate will be achieved for each new or modified source; and
- (C) other sources owned or operated by the applicant within the state are in compliance with requirements of this chapter and the Clean Air Act (P.L. 91-604) as amended August 7, 1977 (P.L. 95-95).

(d) A permit to operate

- (1) will be granted for no more than five years, after which the permit must be renewed for continued operation of the facility;
- (2) will include a compliance schedule if the facility is emitting air contaminants in excess of applicable limitations contained in this chapter, based on the minimum time necessary to install the required control equipment, a permit which includes a compliance schedule must be renewed every year of its duration;
- (3) will, in the department's discretion, require the permittee to install, use, and

maintain monitoring equipment, to sample emissions according to methods prescribed by the department, at locations and intervals and by procedures specified by the department; to provide source test reports; to provide monitoring data, emission data, and information from analyses of any test samples; and to make periodic reports on process operations and emissions;

(4) will, for an application submitted under 18 AAC 50.300(a)(8), include specific limitations on emissions or operations as necessary to exempt the facility from 18 AAC 50.300(a)(5) — (7) or any other requirement of this chapter;

(5) will, in the department's discretion, require that specific emission reduction procedures be taken during an air episode;

(6) may not be transferred without the written consent of the regional supervisor.

(e) If an application for a permit is denied, the department will notify the applicant by certified mail, stating the reasons for denial. The notification will include a statement that a person aggrieved by the department's decision may request in adjudicatory, hearing within 30 days after service of the denial under 18 AAC 15.200 -- 18 AAC 15.310. For applications subject to (a) of this section, a copy of the final determination will be published and distributed as described in (a)(1) of this section.

50.410. [Repealed]

ARTICLE 4. REGULATION COMPLIANCE CRITERIA

- 50.500. SOURCE TESTING. (a) Except as provided in (d) of this section, the department will, in its discretion, conduct or have conducted air contaminant emission tests to determine compliance with this chapter.
- (b) Testing to determine compliance with this chapter must be by methods approved by the department and done at a point or points which characterize the actual discharge into the ambient air.
- (c) Except as provided in (d) of this section, air contaminant emission tests must be done at maximum rate burning or operating capacity of the unit, or other

rate determined by the department to characterize the actual discharge into the ambient air.

- (d) Demonstration by source testing of compliance with the requirements of 18 AAC 50.040(a)(2) and (b)(2) for incinerators greater than 4,100 pounds per hour, 18 ACC 50.050(a)(1) for catalyst cracking unit catalyst regenerators, 18 AAC 50.040(c), 18 AAC 50.050(a)(4) (8) and (d) must be done at maximum operating or production rates within 180 days after startup of a new or modified source. Source test methods specified in 40 CFR 60, Appendix A, as amended through November 1, 1982 or their equivalent are to be used as follows:
- (1) for emissions of particulate matter, procedures specified in reference methods 1, 2, 3, 4, and 5;
- (2) for emission of carbon monoxide, procedures specified in reference method 10:
- (3) for emissions of sulfur dioxide, procedures specified in reference methods 1, 2, and 6;
- (4) for emissions of reduced sulfur compounds, procedures specified in reference method 15:
- (5) for hydrogen sulfide content of process fuel gas streams, procedures specified in reference method 11; and
- (6) for visible emissions, procedures specified in reference method 9.
- (e) If the provisions in (d) of this section do not apply, then compliance with emission standards must be measured by the following:
- (1) for emissions of particulate matter, procedures specified in reference methods 1, 2, 3, 4, and 5 of Appendix A to 40 C.F.R. sec. 60 as amended through November 1, 1983;
- (2) for emissions of sulfur dioxide, procedures specified in reference methods 1, 2, and 6 of Appendix A to 40 C.F.R. sec. 60 as amended through November 1, 1983; and
- (3) to determine the reduction of visibility and opacity of exhaust gases, the procedures specified in the department document entitled "Alaska Air Quality Visible Emissions Evaluation Procedures" (dated August 1983).
- (f) To determine compliance with this chapter, standard exhaust gas volumes

must include only the gases formed from theoretical combustion of the fuel, plus the excess gas volume normal for the specific source type, corrected to standard conditions.

50.510. AMBIENT ANALYSIS METHODS. (a) Air quality data and analyses submitted in support of a permit application under 18 AAC 50.300(a)(5) or (6) must comply with procedures set out in the department document entitled "ADEC Ambient Analysis Procedures" (dated July 1982).

(b) Continuous ambient air monitoring is required in support of a permit application submitted under 18 AAC 50.300(a)(5) or (6) for each pollutant which exceeds the limitations described in 18 AAC 50.300(a)(6)(C)(i) — (xvii) unless the existing concentrations or the predicted ambient air quality impacts are less than

(1) carbon monoxide - 575 ug/m³, 8-hour average;

(2) nitrogen dioxide - 14 ug/m³, annual average;

(3) total suspended particulates -10 ug/m³, 24-hour average;

(4) sulfur dioxide — 13 ug/m³, 24-hour average;

(5) ozone —any increase in allowable or actual volatile organic compounds emissions of 100 tons per year or more;

(6) lead — 0.1 ug/m³, quarterly

average;

(7) mercury — 0.25 ug/m³, 24-hour average;

(8) beryllium - 0.001 ug/m', 24-hour average;

(9) fluorides — 0.25 ug/m³, 24-hour average;

(10) vinyl chloride - 15 ug/m³, 24-hour average; and

(11) hydrogen sulfide — 0.2 ug/m³, 1-hour average.

50.520. EMISSION AND AMBIENT MONITORING. (a) Operators of facilities requiring a permit under 18 AAC 50.300 shall install, maintain, and operate continuous ambient air quality, meteorological, process, or emission monitoring and recording devices specified by the department and in accordance with 40 CFR sec. 58, Appendix B, as amended through November 1, 1983.

(b) Operators of facilities subject to 18

AAC 50.040(b)(2), 18 AAC 50.040(c), 50.021(b)(1) of this chapter will not be or 18 AAC 50.050(d) shall install, maintain, and operate continuous emission and process monitoring devices, keep records. and report excess emissions in accordance with procedures established in 40 CFR sec. 60 as amended through November 1. 1983.

(c) The department will, in its discretion, require the owner or operator of an air contaminant source to keep records and periodically report on the nature and amount of emissions as necessary to determine compliance with this chapter.

50.530. CIRCUMVENTION. (a) Use of air for dilution of emission contaminants without causing a total decrease in the contaminants is not permitted as a method of compliance with this chapter, except that dilution air may be used at sulfur recovery plants with a maximum production rate of 20 long tons per lay or less to achieve compliance with the 500 ppm sulfur dioxide requirement in 18 AAC 50.050(c).

(b) A person owning or operating a facility emitting air contaminants subject to the limitations and provisions of this chapter shall ensure that the facility is in compliance with this chapter and any other applicable local, state, or federal law.

(c) Stack heights which exceed good engineering practice, or dispersion techniques, may not be used to affect the degree of emission limitation required for control of air contaminants.

(d) No person may construct, operate. or modify an air contaminant emission source which will result in a violation of the applicable emission standards or will interfere with the attainment or maintenance of the ambient air standards of this chapter.

ARTICLE 5. PROCEDURAL AND **ADMINISTRATIVE**

50.600. RECLASSIFICATION PROCEDURES AND CRITERIA. (a) The department will, in its discretion, periodically review and revise the air quality classifications within the state after notice and public hearing, except that

(1) the areas identified in 18 AAC

reclassified: and

(2) the following areas may be reclassified only to Class I or II;

(A) an area which exceeds 10,000 acres in size and is a national monument, national primitive area, national preserve, national recreation area, national wild and scenic river, national wildlife refuge or range, or national lakeshore or seashore;

(B) a national park or national wilderness area established after August 7, 1977 which exceeds 10,000 acres; and

(3) land within the exterior boundaries of reservations of federally recognized Indian tribes may be redesignated only by the appropriate Indian governing body.

(b) Reclassification will be initiated by the department on its own motion, or upon receipt of a petition for reclassification containing

(1) detailed reasons why reclassification is requested and is in the best interests of the public:

(2) an accurate description of the proposed boundaries of the area and the air equality within it:

(3) a detailed evaluation of emission and ambient air quality effects of any proposed new or modified facility;

(4) an evaluation of the effects of any proposed new or modified facility on air quality within other areas classified under 18 AAC 50.021;

(5) a detailed analysis of the health, environmental, economic, social, and energy effects of the proposed reclassification;

(6) if an area proposed for reclassification includes or is part of a local government jurisdiction

(A) a resolution recommending reclassification and adopted by each affected unit of local government; and

(B) evidence that the resolution required under (A) of this paragraph was adopted after public hearing with at least 15 days' prior notice published in a newspaper of general circulation.

(c) The department will review the petition for reclassification within 30 days after receipt and will accept it for consideration if it satisfactorily describes the circumstances behind the proposed reclassification and meets the requirements of

- (b) of this section Within 10 days after acceptance under this subsection, the department will send to any affected federal land managers a draft notice of public hearings to be held on the proposed reclassification and allow 30 days for comments. Within 10 days after the comment period, the department will publish in one or more newspapers of general circulation in the area for which reclassification is sought. notice of public hearings on the proposed reclassification to be held in areas likely to be affected. The notice will include a summary of the petition, the federal land manager's comments, and the department's analysis, and will state where copies of the petition and the analysis may be obtained. The notice will be published at least 30 days before the first hearing. Copies of the notice will be sent for review and comment to state department commissioners, members of the state legislature and the Environmental Advisory Board, affected federal land managers, and to units of local government within the affected area.
- (d) Public hearings on proposed reclassification will be conducted as follows:
- (1) the deputy commissioner or a designee will serve as hearing officer;
- (2) the hearings will be electronically recorded, and witnesses will testify under oath:
- (3) the hearing officer may question a witness and will permit any reasonable, pertinent testimony to be presented; and 50.610. AIR EPISODES. (a) An air episode will be declared when, in the opinion of the commissioner, the concentra-
- (4) written testimony may be introduced into the record of the hearing within 15 days following the hearing.
- (e) The hearing officer will summarize the hearing record and submit a recommendation, with the basis for approval or disapproval of the reclassification, to the commissioner. The recommendation will be sent to those officials and agencies identified in (c) of this section, and to persons who submitted testimony into the public hearing record, requesting their comments within 20 days after they receive the recommendation.
- (f) Within 15 days after the close of the comment period under (e) of this section, the commissioner will approve the proposed reclassification if
- (1) the health, environmental, economic, social, and energy effects of the proposed reclassification are in the public interest; and

- (2) reclassification will not cause or contribute to air pollutant concentrations which exceed the standards in 18 AAC 50.020.
- (g) The department will annually review the air quality classifications to determine if any areas should be proposed for reclassification. The department will annually publish a summary of the classifications, any petitions for reclassification received, and air quality conditions in the state. Copies will be sent to the officials and agencies identified in (c) of this section and, upon request, to other interested persons.
- (h) If an area of the state is proposed for reclassification
- (1) by the department, the data specified in (b) of this section will be made available to the public at the time of public notice; the requirements of (c), (d), (e), and (f) of this section will be followed in acting on all reclassifications; or
- (2) by a private individual or organization without the resources to submit a complete petition under (b) of this section, the department will provide technical and coordinative assistance to ensure reasonable opportunity for full evaluation of the proposed reclassification.
- 50.610. AIR EPISODES. (a) An air episode will be declared when, in the opinion of the commissioner, the concentration of air contaminants in the ambient air has reached or is predicted to reach any of the following:
 - (1) for an air alert
- (A) sulfur dioxide 800 micrograms per cubic meter (24-hour average);
- (B) particulate matter 375 micrograms per cubic meter (24-hour average); and
- (C) carbon monoxide 17 milligrams per cubic meter (eight-hour average); and
- (D) particulate matter generated from wood-burning activities within wood smoke control areas 150 micrograms per cubic meter (24-hour average);
 - (2) for an air warning
- (A) sulfur dioxide 1,600 micrograms per-cubic meter (24-hour average);
- (B) particulate matter 625 micrograms per cubic meter (24-hour average); and
 - (C) carbon monoxide 34 milligrams

- per cubic meter (eight-hour average), and (3) for an air emergency
- (A) sulfur dioxide 2,100 micrograms per cubic meter (24-hour average);
- (B) particulate matter 875 micrograms per cubic meter (24-hour average):
- (C) carbon monoxide 46 milligrams per cubic meter (eight-hour average).
- (D) particulate matter generated from wood-burning activities within wood smoke control areas 260 micrograms per cubic meter (24-hour average).
- (b) The commissioner will prescribe and publicize curtailment actions when a level of air contaminants in (a) of this section is about to be reached.

50.620. AIR QUALITY CONTROL PLAN. The documents and procedures referred to in 18 AAC 50.021, 18 AAC 50.500 and 18 AAC 50.510 are included in vols. II and III of the Air Quality Control Plan. Those volumes of the plan, as amended through November 1, 1983, for implementing and enforcing this chapter, may be reviewed at the central office of the department and are incorporated by reference as part of this chapter.

ARTICLE 6. GENERAL PROVISIONS

- 50.900. DEFINITIONS. In this chapter (1) "actual emissions" means the average rate, in tons per year, that the facility actually emitted during the most recent two years of normal operation; facility-specific allowable emissions may be considered actual emissions:
- (2) "air contaminant" means dust, fumes, mist, smoke, fly ash and other particulate matter, vapor, gas, odorous substances, or a combination of these things;
- (3) "air curtain incinerator" means a incinerator in which large amounts of combustible materials are burned in a rectangular container equipped with an overfire air system;
- (4) "allowable emissions" means the calculated emission rate of a source or facility using the maximum rated capacity and enforceable limitations and conditions on emissions or operations;
 - (5) "ambient air" means that portion of

the atmosphere, external to buildings, to which the public has access;

- (6) "asphalt plant" means a facility which manufactures asphalt concrete by heating and drying aggregate and mixing asphalt cements; the term includes any combination of dryers, systems for screening, handling, storing, and weighing dried aggregate, systems for loading, transferring, and storing mineral filler; systems for mixing, transferring, and storing asphalt concrete; and emission control systems within the facility;
- (7) "baseline concentration" means the ambient concentration level for a pollutant which exists on the applicable baseline date, plus the contribution from allowable emissions of a facility described in 18 AAC 50.300(a)(5) and (6), for which construction began before January 6, 1975. but which was not in operation by the baseline date, minus the contribution from actual emissions from a facility described in 18 AAC 50.300(a)(5) and (6) constructed or modified on or after January 6, 1975:
- (8) "baseline date" means, for each air contaminant and for any air quality control region in which a facility would locate or have an air quality annual impact equal to or greater than one microgram per cubic meter, the earliest date after August 7, 1977 and before November 1, 1982 on which the first permit application was found to be complete by the Environmental Protection Agency, or the date after November 1, 1982 on which information required under 18 AAC 50.300(c) for a facility subject to 18 AAC 50.300(a)(5) and (6) is submitted;
- (9) "best available control technology" means the emission limitation which represents the maximum-reduction achievable for each regulated air pollutant, taking into account energy, environmental and economic impacts, and other costs; the resulting emissions must comply with applicable federal emission standards; best available control technology may include, for example, design features, equipment specifications, work practices, operational standards, or combinations of these factors;
 - (10) "Btu" means British thermal unit;
- (11) "coal preparation facility" means a facility which prepares coal by breaking, crushing, screening, wet or dry cleaning, or thermal drying, and which processes

more than 200 tons per day of coal; the term includes any combination of thermal dryers, pneumatic coal cleaning equipment, coal processing and conveying equipment, breakers and crushers, coal storage systems, and coal transfer systems within the facility;

- (12) "commissioner" means the commissioner of environmental conservation;
- (13) "construct" means to make any physical change to a facility change in method of operation which would result in a change in actual emissions;
- (14) "department" means the Department of Environmental Conservation;
 - (15) [Repealed]
- (16) "dispersion technique" means a technique that attempts to reduce the concontration of an air contaminant in the ambient air by
- (A) using that portion of a stack which exceeds good engineering practice stack
- (B) varying the emission rate of an air contaminant according to atmospheric conditions or ambient concentrations of that air contaminant; or
- (C) increasing exhaust gas plume rise by manipulating a source process parameter, exhaust gas parameter, or stack paseveral existing stacks into one stack, or by other selective handling of exhaust gas streams; this does not include
- (i) reheating a gas stream, following use of an emission control system, to its original discharge temperature;
- (ii) combining the exhaust gases from several stacks into one stack if the facility was originally designed and constructed with combined exhaust streams:
- (iii) combining the exhaust gases from several stacks into one stack, if done concurrently with the installation of an emission control system accompanied by a net reduction in the allowable emissions of the controlled air contaminant; or
- (iv) any technique that increases the exhaust gas plume rise if the allowable emissions of sulfur dioxide from the facility are less than 5,000 tons per year.
 - (17) [Repealed]
- (18) "emission" means release of air contaminants into the environment;

each applicable local air quality control plan, which will not interfere with attainment of the ambient air quality standards:

(20) "excessive concentration" means. in determining good engineering practice stack height.

(A) a maximum ground-level concentration caused by emissions from the stack which is at least 40 percent in excess of the maximum concentration experienced in the absence of downwash, wakes, or eddy effects produced by any nearby structure or nearby terrain feature:

(B) for a source seeking to establish good engineering practice stack height under (23)(C) of this section, a maximum ground-level concentration as described in (A) of this paragraph caused by emissions from the individual stack which, in addition.

(i) contributes to a total concentration due to emissions from all sources which is greater than an ambient air quality standard in 18 AAC 50.020(a); or

(ii) for a source described in 18 AAC 50.300(a) (5) or (6), contributes to a total concentration due to emissions from all sources which is greater than an allowable increment in 18 AAC 50.020(b);

(C) for an existing source seeking to rameter, combining exhaust gases from establish good engineering practice stack height under (23)(C) of this section, a maximum ground-level concentration as described in (B) of this paragraph if the allowable emission rate used in a modeling demonstration for determining the creditable stack height does not exceed

(i) that required by the most recent federal new source performance standard applicable to the source category; or

- (ii) an alternative emission rate established by the department in consultation with the source owner or operator, after the owner-or-operator-demonstrates to the satisfaction of the department, or the authority administering the state implementation plan, that the most recent federal new source performance standard applicable to the source category is infeasible; or
- (D) for a source seeking credit for an increase in existing stack height up to the height determined under (23)(B) of this section,
- (i) a maximum ground-level concentra-(19) "emission allowance" means, for tion as described in (B) of this paragraph, each nonattainment pollutant, the amount if the allowable emission rate used in a of air contaminant emissions allowed from modeling demonstration is the emission new or modified facilities, as defined in rate specified by the State Air Quality

Control Plan, or other applicable state ation, from that which would exist under implementation plan, or, in the absence of such a limit, the actual emission rate, or

- (ii) the actual presence of a local nuisance caused by emissions from the existing stack as determined by the department or other authority administering the state implementation plan;
- (21) "facility" means pollutant-emitting sources or activities which are located on one or more contiguous or adjacent properties and which are owned or operated by the same person or by persons under common control:
- (22) "fuel burning equipment" means a combustion device capable of emission, including flares but excluding mobile internal combustion engines, incinerators, marine vessels, backyard barbecues, and wood-fired heating devices:

(23) "good engineering practice" means, for stack height, the greater of

- (A) 65 meters, measured from the ground level elevation at the base of the stack, or, for a source located offshore, measured from mean lower, low water;
- (B) the height, measured from the ground-level elevation at the base of the stack, or for a source located offshore measured from mean lower, low water, of any nearby structure plus one and one-half times the lesser dimension (height or projected width) of the nearby structure; unless a field study or fluid model required by the department or other authority administering the state implementation plan verifies that the emissions from the stack at this height-would not result in an excessive concentration of a regulated air contaminant as a-result of atmospheric downwash, wakes, or eddy effects created by the source itself, any nearby structure, or any nearby terrain feature; or
- (C) the height demonstrated by a fluid model or a field study approved by the department or other authority administering the state implementation plan which ensures that the emissions from a stack do not result in an excessive concentration of a regulated air contaminant as a result of atmospherio downwash, wakes, or eddy effects created by the source itself, any nearby structure, or any nearby terrain feature;
- (24) "impairment of-visibility" means a

natural conditions:

- (25) "incinerator" means a device used for the thermal reduction of garbage or other wastes, other than an indoor stove or fireplace, but including air curtain incinerators:
- (26) "lowest achievable emission rate" means that rate of emission which reflects the most stringent emission limitation imposed in any state, or any emission control which has been achieved in practice by comparable sources;
- (27) "maximum conbustion efficiency" means, for open burning, that the following are attempted; material should be kept as dry as possible through cover or dry storage; noncombustibles are separated before burn; natural or artificially induced draft is included; combustibles are separated from grass or peat layer; and combustibles are not allowed to smolder,
- (28) "modify" means to make a change or a series of changes in operation, or any physical changes or additions to a source which increase the actual emissions of an air pollutant:

(29) "nearby," as used in the definition of "good engineering practice" in this section, means,

- (A) for any structure in applying the formula in (23)(B) of this section, that distance up to five times the lesser of the height or the width-dimension of a structure but not greater than 0.8 kilometers; the height of the structure is measured from the ground-level elevation at the base of the stack, or for sources located offshore, measured from mean lower, low water:
- (B) for any structure or terrain feature in determining good engineering practice stack height with a fluid model or field study as prescribed in (23)(C) of this section, not greater than 0.8 kilometers. except that portion of a terrain feature may be considered to be nearby if it falls within a distance of up to 10 times the maximum height of the terrain feature, but not greater than 3.2 kilometers, provided that within 0.8 kilometers from the stack, the terrain feature achieves a height that is at least 40 percent of the good engineering practice stack height determined by the formula in (23)(B) of this humanly perceptible change in visibility section or 26 meters, whichever is greater, such as visual range, contrast, or color- as-measured-from the ground-level eleva-

tion at the base of the stack or, for a source located offshore, measured from mean lower, low water; the height of the structure of terrain feature is measured from the ground-level elevation at the base of the stack, or, for a source located offshore, measured from mean lower, low water.

- (30) "opacity" means the characteristic of a substance which renders it partially or wholly impervious to transmittance of light;
- (31) "open burning" means the burning of a material which results in the products of combustion being emitted directly into the ambient air without passing through a stack or flare;
- (32) "particulate matter" means a material except water which is, or has been, airborne and exists as a liquid or a solid at standard conditions:
- (33) "petroleum refinery" means a facility engaged in the distillation of petroleum or redistillation, cracking, or reforming of unfinished petroleum derivatives;
 - (34) "ppm" means parts per million;
- "practical means available" (35)means, when approving the open burning of liquid hydrocarbons produced during oil or gas well testing, that all alternative disposal methods will have been analyzed, and when an environmentally acceptable procedure exists, it will be required;
- (36) "putrescible garbage" means a material capable of being decomposed with sufficient rapidity to-cause nuisance or obnoxious odors;
- (37) "reconstruct" means to make equipment or process changes for which the capital cost exceeds 50 percent of the fixed capital cost of a comparable new source or facility;
- (38) "reduction of visibility" means the obscuring of an observer's vision:
- (39) "regulated air pollutant" means an air pollutant regulated under Clean Air Act (P.L. 91-604) as amended August 7, 1977 (P.L. 95-95);
- (40) "smolder" means to burn and smoke without flame:
- (41) "source" means a structure, building, installation, or other part of a-facility which emits or may emit a regulated air pollutant;
 - (42) "stack" means a chimney or con-

duit installed after air-pollution control equipment through which air or air conta-

- (43) "standard conditions" means a dry gas at a temperature of 70 degrees Fahrenheit and a reference pressure of 14.7 pounds per square inch;
 - (44) "tpy" means tons per year; and
- (45) "ug/m" means micrograms per cubic meter of ambient air.
- (46) "regional supervisor" means the supervisor of the department's regional ofminants are emitted into the environment; fice located at Juneau, Anchorage, or Fairbanks;
 - (47) "wood-fired heating device" means a device designed for wood combustion so that usable heat is derived for the interior

boilers which burn wood; and

(48) "wood smoke control area" means a geographic location within the state where wood-burning activities have resulted in a minimum of two individual 24hour periods when ambient exposures of of a building, and includes wood-fired total suspended particulate matter solely stoves, fireplaces, wood-fired cooking from this activity have reached or exceedstoves, and combination fuel furnaces or ed 150 micrograms per cubic meter of air.

Appendix D
Power Plant Operating Logs

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	Œ)	BTEAM	GRNE	GENERATION		Log			BO	1 LER	No:	6	2		111-111] =								1
	5.5	:	5.5		11	-	2			-	- -	-					100	7777	9,	DATE	Ö	250	49	-]
+××	- M 4 M 4		* KEMH	- MMP MO	0 M A MIL 0 M A M M II 0 M A M M II		NAME &			~=·			4.000	WO 2403		040 O	~*		MCITAGO MCITAGO	~ X &			DELERATOR	
	45HB		- WANA Mandeles	11. 11.0#		- MG - MG - MG - MG - MG - MG - MG - MG	24G 24G							•			₩ ~~#	PMM4	P ←M≥I	L/3 201 6- cml	- (a4 35 	310.03	ļ	- W 31 A
3	200	880	2/6	-	130) در ا	11053	//3	3031		6 5	2	- -	- -		1	H	7		-	- -	- 15	-#	
3	3	15%	2	1/-	/30	7	12	1-	3, 5		2 2	十	1		<u> </u>	1	2/	<u>,</u>		<u>.</u>	777	र्या र	의	2
Š	7/2	180	12,	1	136	}~	;}-	· J	٠,	. I `.			*	2	6	1		7/	22	200	27.1%	2		-7
3	6.16	6.40	22	1/-	-				, ,		10	4,	1		- J .	9	_3_	0	7	7		~	27	5
3	N V	680	દુક	-	 	25		た		ŧ	× 2	16	小	٩.	- -	200		- 1	<u>ν</u> [➾	50 16	<u>.</u>	-	
3	6/0	1880	1630	-/-	13.	-	1-	; ;	Λí '	1.	1/2		1	1:0		__		5	7	ज	J	5.28	1220	d
3	979		17,	1	1	1 4	- [7	-			-	1	5	3.5	1	24	7	2	5	5/1/69	6	-	
255	615	886 1	150	1	/30	1	-	_	-		1	-	1	.1	- -	_ (0.0	2			65 17(420	0
3	6/0	175	-	1	-	10		7 / 17		1	7/2	- -	1		V	<u>i</u>				寸	3	_ .	-1	T
3	9/9	890	830	0	13, 6	77.76	₩_	J <	j.	1	<u>\</u>	1	100	小	- -	1/2	200	200		- -	1	777	2	5
3				_	-	-	-	Ŀ	1	K	11/2	ルボ	13	斗	1	1		7	2		7	9	- -	T
1186	1/3	663	Í	T,	1,	1	1 3	1			3	シー	- -	- -	_	1		1	1	_}	-	121	72	W
827	0/3	10	22.5	40	30.	0 0	11	IL	1	1		-∦-	9		<u>~ </u>	2	~/				13	12.51	-	
33	0/0)		12/2	+	7,00	1 2	×	-1-	1/1	× 1,	4	- -	30/	14	- -	7:7	. 👊	4.2		ひ	W	15.51 3	5 220	2
3	-	0.2× 0.8	٠.	╁	-}	2/2	3/3			+	7		108	1	o .	<u>.</u>	100	4	1	অ	7	2,5	-	\neg
3	+	0008				월날				+	1		4	. 1	<u>~</u>	اف	<u>w</u>	N	3	984	W	2	5 23	2
3	_	25.0	.l.	7		1 ,	2 3	-1-	जं	X	4	-}-	900		-}-	019	3	00	3	286	0	2	-	7
\vdash		896 820	1	7~	120 6	3	20/02		212	计	2				-			4	_~	 ∫-	3	2	5 1220	0
3	_	0.08/06%	 -	1	╌	2 2	ィヽ	712	1		4	4.	8	. 7	4 0	7	~ 1	0	7257	!_	7	7		T
3	_	890 820	.	-	-{	10	~ ·	17507	1/	x ()	2/2	- -	1	7 7		<u> </u>	<u> </u>	0	4	5	2/2	12/28	3 220	0
3	sap	89015	_	尸		1 2		10	ء از	1	7/2	¥ e		- ا ر	4/2	200	-1-	Q r		-	3	-1-		
318	9			0) —	1.5	00, 08	1	ر ا	1.2	1		1/	7-	-}-	: I :	750	1.	47.47	177 9		ar 147	27.0	2
200	1	870 8	820 0			2	0/1080	·}	\ \ \ \	<u> </u>	10	1	4	Ή.	3	3 7		3 3	-1-	- 	477	2021	320	<u> </u>
3	8/0/9	8501820	201	2 11:	3012	7		2:307	2		1:2	-	, ,	1,	- -	1		4 1	35	12	-7	2	·· -	2
IN SECTION	THE POST NEW 24	14 1452741	243							1		777		1		3		3	7	_11		77	-	7

Appendix E Field Data, 20 Jun 89

	ú	40	in Hg	,	HO FINE			±	1/4 / N		(p,		MPINGER OUTLET	(0F)	4500	5.4	(%)	62	59	69	1. 7.	7.1	70	63	60					1		
	2 2 2 3 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1	STATION PRESS	29 20	HEATER BOX TEMP	PROBE HEATER SETTING		PROBE LENGTH	9/	0.3.17	180	DRY GAS FRACTION (Fd)	S TON VS	, w	(OF)	75%	256	25.6	366	764	26.5	369	7987	-363	26.2	n							
7 = 2	//·	ST			4#=191 PRG		·			පී	DRY	GAS METER TEMP	1	(oK) (oF)	77	78	15	79	80	0%	87	8.3	24	78						+		1
whoich	· 16 Steam		Tm. Vo	Ts .	ħ		- 5H.91) S	1" de	,		GAS	NI 9	an	44	88	38	32	33	77/	3,5	100		1/5	3			1				+
A SHEET	40,000	(5130.Fd.Cp.A 2	- 7	7	ן טי	P. tol leak thanklid 16ths - 500,0)	post tost leak worked 7"thy - four	1	BL-040	GAS	SAMPLE	354 237											372,788							
SAMPLING DATA SHEET	OR = OF + 460	. L	H = 513		- 1 - 11 Fit (<u>.</u>	17. tes/ 104	,	posttust	?	Scot	ORIFICE	DIFF. PRESS. (H)	3,34	3.50		3.35	767	1.7.1	0.44	0,75	0.30	12	0.75								
J.E				1	٠ ح	•						VELOCITY	HEAD (Vp)	:23	,34	4.6	77	5)-	100	232	101	77.	50.	501								
PARTICULA SCHEWATIC OF STACK CROSS SECTION	-			+	\ /					-	-> z -^\%	STACK TEMP	(Ts) (°R)								 				1			+			+	
IATIC OF ST	-	<u>_</u>	ر کر بر	なかが	<u> </u>			~	meter Box	1	7.0	/ STACK	A (OF)	245	275	27.7		29 6	235	13.4	737	232	162	±31						1		
SCHE						, T			1.5			1 STATIO	(An H20)	ሄ			2	400		_		~	15	8								
11.	7/	SINK SA	1	2 PUTA	E AR	BOX NUMBER		MBER				SAMPLING	A (min)	a	2.5	7,0	1 ^	12.5	15	175	30	33.5	25	275	1945765							
RUN NUMBER	/, DATE	ġ		POWER	BASE	ጉሥ		METER BOX NUMBER	Qw/Qm	8	3	TRAVERSE	NUMBER	~ "	7	H 2	. 7.	7	7	8	4	22	77	7)					+	+		
													ا المح المح	2	13		سياتك				-		L.	121	.l	أسسا	l		!		<u></u>	

				1 A A P	ICULA I E	SAMPLING DAIA	1 2 1 1 1 1					
RUN NUMBER	2/2	SCHEMA	SCHEMATIC OF STACK CROSS SECTION	CK CROSS	SECTION	EQUATIONS				AMBIENT TEMP	T TEMP	
- 1	1					OR = OF + 460	ō.			STATIO	STATION PRESS	I o
$^{\prime}$	ジンド タケ					H = 5130	p. A 3	Tm. Vo		44	28.20	in Hg
PLANT	R PLANI						ి .	,		HEATER	BOX TEMP	90 편
BASE CLASTAR	E A R									PROBE	PROBE HEATER SETTING	Ęę.
SAMPLE BOX NUMBER	NUMBER									PROBE LE	PROBE LENGTH β μ	,
METER BOX NUMBER	UMBER					·				NOZZLE	AREA (A)	## 4 # Q
Qw/Qm						·				Cp	77	
ပိ										DRY GA	DRY GAS FRACTION (Fd)	6
TRAVERSE	SWIGHTS	V AGTATIC.	STACK TEMP	TEMP	VELOCITY	ORIFICE	GAS	GAS	GAS METER TEMP	МР	SAMPLE	IMPINGER
POINT	TIME 13 (min)	PRESSORE (in H20)	(oF)	(Ts) (oR)	, HEAD (Vp)	OIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	IN (9F)	AVG (Tm) (oR)	OUT (OF)	BOX TEMP (0F)	OUTLET TEMP (OF)
1	0	1,1	395		41.	30.8	373.788	15		સુક	256	70
۲	۶ ک	4	13.75		. 7.3	1:61		96		88	255	97
3	5		395		, 14	3.03		38		63	256	65-
4	25	4	152		0/1	1.5.1		/0/		20	260	2)
7	10	7,	393		60,	1.36		163		200	ıŀ	67
3	125		2,7.5			1.00		107		\ \ \	85.7	- 1
	15	5.5	377		.05	0.76		591		7,7	200	× 3
95	,,,,	2	300		20.	777.0		1001		200	2 5 4	69
10	315	16	1. X L		,03	0.4 6		/0 /		93	355	69
11	35	ષ	بى ئى ئى			0.61		103	5	9.4	750	69
1.5	375	1.5	38%		٠٥ ع	0.46		10.3	5	9.5	2.57	63
	32(54,)	ļ	ر د لا ر		11.17		588,840		66	1		
		<u> </u>	273		4117	= 1.50		107				
					7515	7.54	3/					
						£43	34.5	147	3			
										 		
	_											

OEHL FORM 18

			ON PARTICUL	ATE ANA	LYTICAL	DATA		
BASE	ľ	DATE		· * · · · · · · · · · · · · · · · · · ·	Т	RUN NUMBER		
CLEAR A		1	TONE	89		. /		
BUILDING NUMBER POWE	? PLANT			SOURCE NU		#21	·	
1.			PARTICU					
	ITEM		FINAL WE	IGHT	INIT	AL WEIGHT	W	EIGHT PARTICLES
FILTER NUMBER			0.517	8	013	1933	0.	2245
ACETONE WASHINGS Half Filler)	(Probe, Front		98.78	15-6	98.6	688	0.	1168
BACK HALF (II neede	od)							
			Total Wei	ght of Partic	ulates Calle	ected	0.3	413 em
II.			WATE	R				
	TEM		FINAL WE	IGHT	INIT	AL WEIGHT (gm)		WEIGHT WATER (@m)
IMPINGEP 1 (*20)			223)	2	00		23
IMPINGER 2 (H20)			2.58	y >	2	00		58
IMPINGER 3 (Dry)			3			0		3
IMPINGER 4 (SIIIca Ge	p()		218	4	2.	00		18.4
			Total Wel	ght of Water	Collected		10	02,0 em
111.			GASES	(Dry)				
ITEM	ANALYSIS 1		ANALYSIS 2	ANA	LYSIS 3	ANALYSIS 4		AVERAGE
VOL % CO ₂	9.D		9,0	9,	0			9.0
VOL % O ₂	10.0		10.0	10.	0			10.0
VOL % CO								
VOL % N ₂								
		Vol 9	6 N ₂ = (100% • % (CO ₂ - % O ₂ -	% CO)			

COMPANY NAME		OBSE	RVATION	DATE	·····	START	TIME	END TIME
USAP		120	050		3	10	42	1501
STREET ADDRESS		SEC		15	30	45		COMMENTS
		1	10	10	11)	10		
CITY	STATE ZIP	2	15	10	20	15		
Clear AFS	Ac	3 ·	15	10	10"	5		
PHONE (KEY CONTACT) Would Shalmaly	Boiles# /	1	Τ.	10	10			
PROCESS EQUIPMENT)	LOSSO TIVO LOSS	5	10	5	1	10		
I Can Bred baller	9000 Has stare	6	110	1	5	10		····
CONTROL EQUIPMENT	OPERATING MODE		15	10	10	10		
Mylane separat	TVS Migripal	7	5	5	1.5	15		····
DESCRIBE EMISSION POINT STEEL STUCK		8	10	10	5	10	3	
SICEX SIGUR		9.	10	10	25	:20	The second	
	· •	10	15	15.	15	10		,
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER	11	10	10	25	25		
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER	12	15	25	40	25	/	· · · · · · · · · · · · · · · · · · ·
Start 300 End	Start 5 End V	13	-25	20	30	20	5/	ost Haw
DESCRIBE EMISSIONS	•	14	25	20	20	100	1-2	331 Has
Start VOFTICE	End I IF WATER DROPLET PLUME	15	100		00	10		
Sian White Lingues	Attached NA Detached	16	110	15	15	15		
POINT IN THE PLUME AT WHICH OPACE			15	10	10	10	/	
Start D-5 A	End	17	1/0	5	5	5		
DESCRIBE PLUME BACKGROUND Start Sken	End .	18	5	5	5	5		
BACKGROUND COLOR	SKY CONDITIONS	19	5	2.	5	5		
Start RW- End	Stan Clean End WIND DIRECTION	20						
Stan 15 4 5 Mp End	Start SE End	21						
AMOIEN JEMP	WET BULB TEMP RH, percent	22		•				······································
Start 78 End ·	1 (5	23						
Stack SOURCE LAY	OUT SKETCH Draw North Arrow	24]				
Plume Sun 💠		25		-				
Wind -			}					
G.		26	ļ					·····
(2	() Emission Point	27		ļ				
	,	28						
	,	29						
		30						
			RVER'S		עאוּצ	1 // /		
بر ا	Observer's Position	()	harle	25	<u>/U. //</u>	Heb	ery	
• • • • • • • • • • • • • • • • • • • •		()	AVER'S S		Atel		1	DATE 20 JUN FO
~ 14			NIZATION		-	1		100700
Sun Loca	lion Line ·	CERT	FO FT	46-16	<u> </u>			DATE
ADDITIONAL INFORMATION	46	Texa	IFIED BY 25 Air(Cark	~!B	rard	,	17 MARS

TRAVERSE STATES	Hypey, (mysens):					ΡA	PARTICULATE	E SAMPLING DATA SHEET	G DATA !	SHEET			:		
Park	N N	NUMBER	, ,	SCHEM	ATIC OF	STACK CROS	S SECTION	LAUDE	TIONS				AMBIEN	IT TEMP	
DATE SQ DATE		S	42					اا د د	. °F + 460						90 F
FOUNE R PLANT FOUNE R PLANT H = \$180 FOCA \$\frac{1}{178}\$, \$trip part of the period	DAT	2	<i>D J T T T T T T T T T T</i>						L	Г			N N	N PRESS	
PLANTE R. PLANT PROUPER RATES SETTING CALEGRED PROUPER PLANT PROUPER HATES SETTING CALEGRED PROUPER PROVINGER		-	ZH & I					H		<u>, .</u>			TARK	BOX TEND	in Hg
AND CONTROL Large AND CONTROL Large	PLA	NT POSS/R	7 126.10 0					· · · · · · ·		 1			2	L 200 L	90 80
CLEGAC ALTERINGER NUMERICAL PLANTING STACK TEAP VELOCITY ONFTICE SWAPLE CHI MAN ONT ON STRUCTION (FM) NUMBER SWAPLING VELOCITY ONFTICE SWAPLE CHI Wish ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE SWAPLE CHI Wish ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE SWAPLE CHI Wish ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE SWAPLE CHI Wish ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE SWAPLE CHI ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE SWAPLE CHI ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONFTICE ONT ON STRUCTION (FM) NUMBER RANDING VELOCITY ONT ON STRUCTION (FM) NUMBER VELOCITY ONT ON STRUCTION (FM) NUME	BAS		1 1 1 1 1 1 1	T									PROBE	HEATER SETTIN	
	2	LEAK	2 AFS												
TRAVERSE SAMPLING	SAM	PLE BOX N	UMBER										PROBE	LENGTH	
TRAVERSE SAMPLING FIFTCH TEACH TEACH		۱											NO7 71		
Continue Continue	ME	ER BOX NU	MBER										7		
TRAVERSE SAMPLING FFFATTERP VELOCITY ORIFICE SAMPLE THAVERSE SAMPLING FFFATTONIES THAVERSE SAMPLING FFFATTONIES THAVERSE FFFATTONIES FFFATTO	(m)	m Ç												1 4	
TRAVERSE SAMPLE 1	3							· · · · · · · · · · · · · · · · · · ·						IS FRACTION (FO	6
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$;	2000	San Iday 3	1/#61011	TS)	ACK TEMP		+	IFICE	GAS	GAS	METER T	EMP.	SAMPLE	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		POINT	TIME TIME	PRESSURE (AM H20)	(0 F		HEAD (Vp)		IFF. RESS. TH	SAMPLE VOLUME (Ct ft)		A.C. (T.E.)	70UT (0F)	BOX TEMP (oF)	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		_		7	43		-		86	408.005	36	12/2	36	2 5.9	300
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		٦	15	7	12.25	,	.33		47		102	 	76	26.4	69
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		7	V	000	36		35,		38		501		9.7	769	73
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		n	15	7	1376		<i>جو</i> ر ا	3,	33		706			367	84
$\begin{array}{cccccccccccccccccccccccccccccccccccc$. \4	01	7	296		,13	7	25°		10 %		7,7	26.3	00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		3		Ġ	398		4/3	1	47		108		00/	263	55
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		7	5/			7	109	1	36		107		37.5	360	500
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		21	17.2	7	1. X		50.	9	17,77		107		D Y	36.6	375
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		5		K (37/1		301	<u>d</u>	1		707		47,	366	25
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Q -	0.4.7	60	23,		2,	\\ 	100		527		200	2000	139
3.65h.y) TS = 334 att = 1.81 113,2174 Tm = 100			27.5	77	337		1);				100		3,6		6.6
VOL = 43,0420			R. (4.18)	17	7]]	1/2		32,17	This	1 1		8	
VOL = 43,0420			-												
VOL = 43,0420															
07h0 = 43.0420							1 175	2	<u>,</u>	75					
VOL 2 43,0420											8				
					-		7	1	3	207					
- 1															
		- 1	•												

BASE	Q			ATE ANA				1
		ATE 2	D] [RUN NUMBER		
CLEAR AFS	>	fg	JUNE			2		
POWER PLA	9NT			SOURCE NU	мвеr _/E/Z.#	21		
l.			PARTICU FINAL WE		INITI	AL WEIGHT	we	IGHT PARTICLES
ITEN	A		(gm)			(\$m)		(øm)
FILTER NUMBER			0.60	38	0,	2944	0.	3094
ACETONE WASHINGS (Pro Hall Filter)	obe, Front	/	102.8	355	102	.7366	0.	0989
BACK HALF (II needed)								
			Total Wo	ight of Partic	ulates Colle	ected	0,	4083 em
11.			WAT	ER				
ITEM	4		FINAL WE		ITINI	AL WEIGHT		WEIGHT WATER (@m)
IMPINGER 1 (H20)			24	7	20	00		47
IMPINGER 2 (H20)			222	5	20	0		22,5
IMPINGER 3 (Dry)			6	.5		0		6.5
IMPINGER 4 (SIIIca Gel)			216	.4	20	50		16,4
			Total We	ight of Water	Collected			92.0 cm
111.			GASES	T		I		
ITEM	ANALYSIS	A N	ALYSIS 2	ANAI	YSIS 3	ANALYSIS 4		AVERAGE
VOL % CO ₂	8.7	8	, 8	8.0	8			8.8
VOL % 0 ₂	10.2	10	7, /	10,	Z			10,2
VOL % CO								
VOL % N ₂								
		Vol % N2	= (100% - %	CO ₂ .%O ₂ .	% CO)		-	

COMPANY NAME			RVATION			START	TIME	END TIME
USAF		22	7 Tin) 27.		12	7:5	1237
STREET ADDRESS CH & HP		MIN	0	15	30	45		COMMENTS
•		1	5	5	5	5.		
CITY	STATE ZIP	2	5	5	10	5		
Clean AFS	AK	3	5	5	2.	5		
PHONE (KEY COMFACT) // Dudy Shorkolus	Source 10 NUMBER Brich # 1	1	5	5	5:	5		
, ,	OPERATING MODE	5	5	5	<u>رسا</u> سد			
PROCESS EQUIPMENT	er 90 kts/hr	6			3	5		
CONTROL EQUIPMENT	OPERATING MODE		5	5	5	5		
. Cyclone separat	OS nommal	7	5	5	5	10		
DESCRIBE EMISSION POINT		8	5	10	5	10		
steel stack		9	10	10	5	5		
		10	5	5	5	5		,
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER Stan / End	11	5	5	5	5		
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER	12	5	5	5	5		
Start 2 50 End	Stan & W End	13	1	12		1 .5		
DESCRIBE EMISSIONS		1 14		<u> </u>		<u> </u> 	<u> </u>	
Stan Offina	End	↓ ├──		 	<u> </u>	1		
EMISSION, COLOR Start WMW/V/EXX	IF WATER DROPLET PLUME Attached D Attached D Detached G	15	ļ			<u> </u>		
POINT IN THE PLUME AT WHICH OPAC	TY WAS DETERMINED	16	<u> </u>	ļ		<u> </u>		
Start 6-5'	End] 17						
DESCRIBE PLUME BACKGROUND		18						
BACKGROUND COLOR	SKY CONDITIONS	19						
Stant Luc Whitens	Stanfar Hey End	20		i i		1		
WIND SPEED	WIND DIRECTION	21		 		1		
SIAN C MONENT	Start End WET BULB TEMP PH, percent	┨├──	 	 . 		 -	<u> </u>	
Start 75 End ·	210	22	 	-		 	 	
	YOUT SKETCH Draw North Arrow	$\frac{23}{1}$	ļ	<u> </u>	ļ	<u> </u>		
with C Plume		24	<u> </u>	<u> </u>	<u> </u>	<u> </u>		
Sun 💠		25						
Wind ->		26						
	Emission Point	27	1	 		7		
	Ì	28	1	1		1	1	
		29	-		 		-	
	\mathcal{V}	11-	-	 		 		
		30	<u></u>	<u></u>	<u> </u>	1	<u> </u>	
,				NAME (F		۔ سندس	12.2 -	
· .	Observer's Position	OBS	HAZL ERVER'S	SIGNAT		اهم _{آ ب} يدا م	sery	DATE
	40.	ILC	har		CO	1		20 Jul 89
	ation Line		ANIZATIC		1-11	boar	1)	CIAP
ADDITIONAL INFORMATION		CER	/ <i>[> </i>]) NFIED B	r 201	N.M.	7 -00 0	· · ·	DATE 12 95
1	50	11		、 ブ				11 - 1 W W Y

14/1 --- W

PLAS CO	NUMBER 1/2 E 20 MT PCWER PLANT PCWER PLANT E AR SAMPLING SAMPLING TIME SAMPLING TIME TI	SCHEMAT SCHEMAT V 3C STATIC PRESSGURE	S STACK	PARTI CK CROSS SE TEMP (TS)	PARTICULATE SAN ROSS SECTION PARTICULATE SAN ROSS HOUSE SAN PARTICULATE SAN ROSS SECTION ROSS ROSS SECTION R	SAMPLING DATA SHE EQUATIONS OR = OF +460 OR = OF +460 OR C C C Post C C C Post C C C Post C C Post C C Post C Po	SHEET $ \frac{90 \text{ bw. } \text{ lb}}{\text{Co}} $ $ (k - k_0) $ $ (k - k_0) $ $ (k + k_$	Transport of the street of the		STATION PRESS 27.20 HEATER BOX TEMP PROBE LENGTH 96 NOZZLE AREA (A) P.4 0 377 Cp & STY DRY GAS FRACTION (Fd) 10 10 10 10 10 10 10 10 10 10 10 10 10	oF oF oF NG '', sqrft sqrft MPINGER YOUTLET TEMP
1425 12 32 2 2 2 2 3 2 3 2 3 2 3 2 3 2 3 2 3	4 (min) 0 2.5 5 7 6 125 175 175 28 33,5 34,5 35 35 35 35 35 35 35 35 35 35 35 35 35	(ma ii 20) 24 27 27 27 27 27 27 27 27 27	(0F) 295 295 300 300 300 300 300 300 300 300 300 30		(vp) \(\frac{\partial \chi_0}{\partial \chi_0} \) \(\partial \chi_	## 3.12 3.12 3.12 3.43 3.43 3.43 1.14 1.14 1.15 1.1	433.440 433.440	(e.f.) 10 10 10 10 10 10 10 10 10 10 10 10 10 1	(0E) (0E) (0F) (0F) (0F) (0F) (0F) (0F) (0F) (0F	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	(a) (b) (c) (c) (c) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d

NAMERIA SCHEMATIC OF STACK CROSS SECTION OR = "P + 140	PARTICULATE SAMPLING DATA SHEET	
THE LEST OF EACH EST THE PRODUCE PLAY I STACK TEMP TO THE PRESENT OF TEMP TO THE PARTY OF TEMP TO THE PRESENT OF TEMP TO THE PRESENT OF TEMP TO THE PRESENT OF TEMP TO THE PARTY OF TEMP TO THE P	m	O L
## \$10 ME 8 7 ANT COURTER PLAY T STEE BOX NUMBER THEN	STATION PRE	
1	S130-Fd-Cp-A 2. Im. Vp HEATER BOX	20 in Hg
C E D C C	Co l	Emr Po
TER BOX NUMBER STACK TEMP VELOCITY OFFICE	PROBE HEATER SETTING	SETTING
TER BOX NUMBER	PROBE LENGTH	
1 1 1 1 1 1 1 1 1 1	NOZZLE ARE	AREA (#)/14
TRAVERSE SAMPLING V4 GT ATJØ 18 STACK TEMP VELOCITY ORIFICE PRESENTE (PP) (TS) (TS) (TS) (TS) (TS) (TS) (TS) (TS	1	
TRAVERSE SAMPLING (#46171)2 ISTACK TEMP VELOCITY ORIFICE POINT TIME (PF) (PF) (PP) ORIFICE POINT TIME (PP) (PP) ORIFICE NUMBER Q (MID) Q (PP) (PP) ORIFICE 1 D (PP) Q (PP) (PP) ORIFICE 2 D (PP) Q (PP) ORIFICE ORIFICE 3 D (PP) Q (PP) ORIFICE ORIFICE 4 D (PP) D (PP) D (PP) D (PP) 4 D (PP) D (PP) D (PP) D (PP) 4 D (PP) D (PP) D (PP) D (PP) 4 D (PP) D (PP) D (PP) D (PP) 4 D (PP) D (PP) D	DRY GAS FRACTION (Fd)	TION (Fd)
Time Pressure OF) (Ts) Head Pressure Number Gamb Gat Had) (OF) (I STACK TEMP VELOCITY ORIFICE GAS GAS METER TEMP	<u> </u>
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	(oF) (TS) HEAD DIFF. SAMPLE (IN AVG 1 OUT) (OF) (OR) (OF) (OF) (OF)	80X ~/ OUTLET TEMP TEMP (°F) (°F)
$\frac{3.5}{5.6}$ $\frac{11}{5.6}$ $\frac{3.45}{5.6}$ $\frac{1.7}{1.7}$ $\frac{3.5}{3.60}$ $\frac{1.7}{1.79}$ $\frac{3.5}{1.79}$ $\frac{1.5}{1.79}$ $\frac{3.5}{1.79}$ $\frac{1.5}{1.79}$ $\frac{3.5}{1.79}$ $\frac{1.5}{1.79}$ $\frac{3.5}{1.79}$ $\frac{1.5}{1.79}$ $\frac{3.5}{1.79}$ $\frac{3.5}{1.79}$ $\frac{3.5}{1.79}$ $\frac{3.5}{1.70}$ $\frac{3.5}{1$	116 3.39 455.609 94 43	
$\frac{56}{15}$ $\frac{56}{35}$ $\frac{56}{35}$ $\frac{56}{15}$ $\frac{56}{35}$ $\frac{15}{15}$ $\frac{395}{15}$ $\frac{11}{15}$ $\frac{395}{15}$ $\frac{11}{15}$ $\frac{11}{15}$ $\frac{390}{15}$ $\frac{11}{15}$ $\frac{11}{15}$ $\frac{11}{15}$ $\frac{11}{15}$ $\frac{11}{15}$ $\frac{11}{15}$ $\frac{11}{15}$ $\frac{39}{15}$ $\frac{399}{15}$ $\frac{399}{$	13.51 1/2 1/3	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3.60 78 93	5,00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	77, 56.35	
$ \begin{array}{ccccccccccccccccccccccccccccccccccc$	101 149	8
30 30 30 30 30 30 30 30	S 14 101 OE.1 80.	7
315 39 397 315	76 00/ 0E1 30'	-
$\frac{35}{34}$ $\frac{39}{34}$ $\frac{39}{34}$ $\frac{39}{35}$ $\frac{105}{34}$ $\frac{39}{35}$ $\frac{105}{34}$ $\frac{34}{35}$ $\frac{105}{34}$ $\frac{34}{35}$ $\frac{105}{34}$ $\frac{105}{34}$ $\frac{105}{34}$ $\frac{105}{34}$ $\frac{105}{34}$ $\frac{105}{34}$ $\frac{105}{34}$ $\frac{105}{34}$	1.05	
34.54.1)	20 100 101 20' Test	20 70
15= 297	Se 46 001 Se.1 60	1
= 297 \\ \(\lambda \tau \rack{1/1 = 1c q \cdot 3}{\rack{1}{773}} \\ \(\lambda \tau \rack{1/2 \cdot c}{\rack{1}{773}} \)		
- 34 - 101	237 418-10 43	
2701	<u>*** ~ ***</u>	
13		
	1	
CFIII FORM S.		_

DEHL FORM 18

€ ± 52

	AIR POL	LUTI	ON PARTICUL	ATE ANA	LYTICAL	DATA		
BASE		DATE	, კ			RUN NUMBER		
CLEAR A			4 JUNE 8			3		
POWER	PLANT			SOURCE NU BO		#2/		
1.			PARTICU	LATES				
	ITEM		FINAL WE		דואו	IAL WEIGHT (4m)	W	EIGHT PARTICLES (gm)
FILTER NUMBER			0.686	4	0,	2902	Ö	13962
ACETONE WASHINGS Hall Filter)	6 (Probe, Front		93,75	17	93.	.6322	0	1195
BACK HALF (II need	od)							
			Total Woi	ight of Partic	ulates Colle	octod	0,5	5157 em
11.			WATE	R	·		·····	
	ITEM		FINAL WE	IGHT	INIT	IAL WEIGHT (gm)		WEIGHT WATER (gm)
IMPINGER 1 <i>(H20)</i>			¥73	6/	ł .	50 -00		51
IMPINGER 2 (H20)			268			50 0 0		18
IMPINGER 3 (Dry)			2			0		2
IMPINGER 4 (SIIIca G	o1)		≳1	7,3	2.	00		17:3
			Total Wei	ght of Water	·			88.0 73.0 sm
111.		,	GASES	(Dry)				
ITEM	ANALYSIS 1		ANALYSIS 2	ANA	YSIS 3	ANALYSIS 4		AVERAGE
∨o∟ % co ₂	8.0	4	8.1	E.	U			8,0
۷٥L % ٥ ₂	11.0	1,	1.0	11,	0			11.0
VOL % CO								
VOL % N ₂								
		Vol %	6 N ₂ = (100% - % (02.2% 02.	% CO)			

VISIBLE EMISSION OBSERVATION FORM OBSERVATION DATE COMPANY NAME START TIME END TIME 1403 50 JUN STREET ADDRESS 0 45 COMMENTS 1 15 20 2 ZIP 15 3 20 SOURCE ID NUMBER 4 30 20 OPERATING MODESTYCEN 6 OPERATING MODE CONTROL ECUIPMENT 7 Sementher Monre DESCRIPE EMISSION POINT 8 9 10 HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER 11 161 100 End DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER 12 NIN 30A Start 13 DESCRIBE EMISSIONS 14 Start End EMISSICN COLOR
Stan IF WATER DROPLET PLUME 15 Bour Attached 3 1/A Detached G 16 POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED Start 0-5 17 DESCRIBE PLUME BACKGROUND 18 Sianbrakin clerido 19 BACKGROUND ECLOR SKY CONDITIONS
Start Allucia SUN WILL END End 20 YVIND SPEED WIND DIRECTION Stan - 5 AMP/End 21 Start 📈 End AMBIENT TEMP WET BULB TEMP RH, percent 22 75 410 Start End 23 2 mcx SOURCE LAYOUT SKETCH Draw North Arrow WITH 24 Piume - Sun 25 Wind 26 15 Emission Point 27 $\mathcal{A}_{\mathcal{O}}$ 28 29 30 OBSERVER'S NAME (PRINT) CHARLES W. Observer's Position OBSERVER'S SIGNATURE DATE 20 JUN 39 ORGANIZATION 497771 Sun Location Line 20 G

CERTIFIED BY

ACDITIONAL INFORMATION

DATE

17 11116 P

		'EY DATA SHEET NO. 2 emperature Traverse)	
CLEAR DES		19 JUNE 89	
CLEAR AFS BOILER NUMBER #2		1	
INSIDE STACK DIAMETER BB STATION PRESSURE			Inches
29.15			In Hg
STACK STATIC PRESSURE 0,13			In H20
SAMPLING TEAM 19 FOEHL			
TRAVERSE POINT NUMBER	VELOCITY HEAD, Vp IN H20	1/2 CACTONIC	STACK TEMPERATURE (0F)
1	.21	10 5 5	212
2	, 16	10 0	258
3	,28	.5 a	274292
L/	.25.23	3 3	274 292 257295
5	0 يە،	ā 10	<i>39</i> 7
6	,17	5 7	298
7	,06	15 15	297
8	, 04	10 5	3 96
9	.04	15 5	296
10	.03	30 0	7,95
11	.06	à0 15	395
12	10%	&C 20	<i>294</i>
		1+VG= 90	
			,
	FPS = 23 f1/se	C	
	71- 285	9.a = 0 39	3
	ΔP = 0.14	futual = 8 377	
	AVERAGE		

OEHL FORM 16

	PF	RELIMINARY SU	RVEY DATA ck Geometry)	SHEET NO. 1
BASE CLEAR A	FS.	PLANT POWEK SAMPLING TEAM	2 PLAN	'T
19 JUNE	89	PROEIT	L	
	EED BOIL	ER.		
SOURCE NUMBER #2		Inside stack dia		Inches
RELATED CAPACITY 100,000.U DISTANCE FROM OUTSID	-STEAM//	ัน	TYPE FL	CUAL
	Dr 0.25			Inches
NUMBER OF TRAVERSES		NUMBER OF POIN	TS/TRAVERSE	
	L	OCATION OF SAMPL	ING POINTS A	LONG TRAVERSE
POINT	PERCENT O DIAMETER	INSID	ICE FROM E WALL Ichee)	TOTAL DISTANCE FROM OUTSIDE OF NIPPLE TO SAMPLING POINT (Inches)
/				2.0
2				5.8
3				10.1
4				15,0
5				21.0
6				29.8
7				53.7
8				62.5
9				68.5
10				73.4
11				77.7
12				81,5

Appendix F Field Data, 21 Jun 89

-					!							
RUN NUMBER	1 1/2	SCH EA	SCHEMATIC OF STACK CROSS SECTION	SK CROSS 3 ?	ECTION	EQUATIONS OD - OF 1 AGO	Scot	BLOW	3	AMBIENT TEMP	ТТЕМР	90
DATE 21 =	JUNE 89		101	(-	130	·	d.Co. A 3		_ 	STATIO 2.	STATION PRESS 29, C.S	in Hg
PLANT	CERTY PONEIR PLOW		4HE=111	-	و د ک ^{ار} کرد کارک	<u>.</u>	•	Ts . vp		HEATE	HEATER BOX TEMP	40
BASE CLE	CLE AC PRA	,0	200			, , ,,,,	0 1 11 11.11.0	0		PROBE	PROBE HEATER SETTING	
SAMPLE BOX NUMBER		15:20	1072			1.767	1065 - 1, 1365 11 - 1, 1365	\		PROBE .	PROBE LENGTH	
METER BOX NUMBER	IUMBER					pretest 1	pretest louk Koukla 4g 1/5- 600.p	2 1/5 1/5	1-6007	NOZZLE	162 E ARET (A) 2.4	
Qw/Qm	2-			١		postleat 1	posticut Lucik (d) 10 "45 - Goorl	"Hz - 6,0	och.	o G	377	ž.
Ċ		3 0				-					/78	
3		Ber				5 ²	Moisture -	7	. —	RY Y	GAS FRACTION (Fd)	
i .		VASTATAC	STACK TEMP	TEMP	VELOCITY	ORIFICE	GAS	GAS	GAS METER TEMP	a. ¥	SAMPLE	IMPINGER
(complete NUMBER 10)	TIME A (min)	PRESSURE (in H20)	(oF)	(Ts) (°R)	HEAD (Vp)	PRESS. (H)	SAMPLE VOLUME (cu ft)	™ (oF)	O TWG	OUT (oF)	BOX TEMP (0F)	OUTLET TEMP (OF)
	0	۴	281		:15	3.13	176.466	7.2	Н	7.3	340	77
7	57	2	182		87.	2.54		73		7.3	152	7,3
9	5	4	377	1	777	3.87		74		23		27
7	7.5	7	33.5		11.	1.30		700		13	26.5	77
))	125	7	7 7 292		60	1.27		25		7	36.5	29
7	15	2	371		80,	1.13		1.3		1/2	277	72
8	17.5	ζ.τε	330		80,	1.13		83		74	370	6.8
->	20	k	388		50€	1.1.3		83		75	364	63
0/	3.86	4	388		, 8.7	66.0		83		75,		66
21 8501	25	را م	1 2 6 7		105	1111		84		75.	367	0 6
	30 (54.10	\$	325		/ 2 .	737	496.503	100		37		
							1 1					
										+		
				-								
	_		_	-								

										250	328	//	
	Qindinya asid				PART	TE	SAMPLING DATA	SHEET	,				
	RUN NUMBER	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	SCHEMA	SCHEMATIC OF STACK CROSS SECTION	CK CROSS S	ECTION	EQUATIONS				AMBIEN	AMBIENT TEMP	
		1/2					OR = OF + 460	0			011013	STATION OBESS	OF
	DAIE 2/J	JUNE 89						2			;		in Hg
	PLANT	1					# #	°	Ts . Vp		HEATER	HEATER BOX TEMP	
**************************************	PONTUIC BASE	ר דבודיבו									PROBE	PROBE HEATER SETTING	OF G
	CLRITZ	2 AFS											
	SAMPLE BOX NUMBER	UMBER									PROBE	PROBE LENGTH	,
	METER BOX NUMBER	UMBER									NOZZE	NOZZLE AREA (A)	u,
	Qw/Qm	J									ථ		ti bs .
and the second section of the second	రి										DRY GA	DRY GAS FRACTION (Fd)	
	1	GNIGHT	1/4/2-1/	STACK TEMP	TEMP	VELOCITY	ORIFICE	GAS	GAS	GAS METER TE	TEMP	SAMPLE	IMPINGER
60 \	POINT	TIME (min)	PRESSURE (in H20)	(oF)	(Ts) (oR)	HEAD (Vp)	DIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	IN (OF)	AVG (Tm) (SR)	OUT (OF)	BOX TEMP (0F)	OUTLET TEMP (OF)
= =	-	0	17	132		18.	3.00	496,502	80		77	270	999
	7	51	Н	186		٠×٠ ا	3,53		84		7.8	25E	67
	3	\$	7	1384		,24	3.41		67		78	264	67
	h	7.5	7	390		.31	3.00		63		73	2113	89
	5	0/	4	37.3		-17	3.43		30		57	350	70
	2 7	(12.5	77	332		1,11	1.9.7		30		79	765	77
<u> </u>	- 0	5/	7	× 1.00		/ 0'	7.00		200			2/2	
	0 7	17.5	40	340		200,	0.00		000		20,0	7 C	7.0
	0/	388	લ	330		10,	1.00		3 33		81	26.3	6.9
	11	25	ح	38J		60,	1.29		88		18	なして	89
<u> </u>	12	375	2	368		011	1.43		83		18	275	6.7
		3c 6tp)		- 1				**************************************		7			
							1.6.7			1/1		**	
حة بريسين	17575=			1			4/11	1.43		1			
	Ts =	287					7 () , ,						
r waaning	ξ:	80			1-4-1	,2 8,	194.51						
Orași san	"	1,00	a.								1		
	100	41.107 5	1			19.04	39						
	macy										1		

	AIR POLL	UTION PAR	TICUL	ATE ANA	LYTICAL	DATA		
BASE	D	ATE			F	UN NUMBER		
Ent. Clear	AFS	21 J	lene	89 SOURCE NUI	VBE D			
BUILDING NUMBER CHPP	•			SOURCE NO	Boily	1		
1.		P	ARTICU	LATES				
l.	TFM	F	INAL WE (£m)		INITI	AL WEIGHT (gm)	WI	EIGHT RARTICLES
FILTER NUMBER		0	,37	143	1288	³ 3		,691¢
ACETONE WASHINGS Hall Filter)	(Probe, Front	10	5,3	759	iø5.	2623		1136
BACK HALF (II neede	d)							
			Total Wel	ight of Partic	ulates Colle	ctod		, 264 6 am
11.			WATE	ER			 -	
l.	TEM	F	INAL WE	IGHT	ודואו	AL WEIGHT (gm)		WEIGHT WATER (@m)
IMPINGER 1 (H20)			Q 5 C)	20 E	7		50-0
IMPINGER 2 (H20)			320	<u> </u>	20	0		28,6
IMPINGER 3 (Dry)			4		()		4-0
IMPINGER 4 (SIIIca Ge	n1)		223	, Ø	<i>3</i> 0	0		23,Ø
				ight of Water	Collected			105 em
101.			GASES	(Dry)				
ITEM	ANALYSIS 1	ANALY 2	sis	ANA	L YSIS 3	ANALYSIS 4		AVERAGE
VOL % CO ₂	7.0	6,	9	6	.9			6,9
VOL % 0 ₂	13.¢	12.	9	13	-1			6,9 13,\$
VOL % CO								,
VOL % N ₂								
		Vol % N ₂ = (100% - %	co ₂ - % o ₂	• % CO)			

DATE 21 JU		SCHEMA	SCHEMATIC OF STACK CROSS SECTION	SK CROSS SI	CTION	EQUATIONS				AMBIENT TEMP	T TEMP	
DATE 21 JL PLANT	ر الا					$^{\circ}R = ^{\circ}F + 460$	Ģ					OF
PLANT	JUNE 89		١-,			-	- 5130-Fd-Co.A 7 2			2,2		in IIg
00.00		,,,,	ے ع ا			# # #	•	Ts. Vp		HEATER	HEATER BOX TEMP	
BASE FLIMUI	17-1 HA 1	<i>J</i>				1,40+ (Lee K	Very 1	2		PROBE 1	PROBE HEATER SETTING	D D
CLEBR AF	AFS						; ;		,	1000		
SAMPLE BOX NUN	## ## ## ## ## ## ## ## ## ## ## ## ##	منب شحصين ومحمد			1	1) 2'02 sul	prelieux (heck 10)15 43	45 - Gross	Joe!	FROBE LENGIN	6 6	q
METER BOX NUMBER	BER					Perther 14	12, 1ke, 16426 6 15 "5 6500 C	185 6700	Š	NOZZLE	64	
Qw/Qm	1	T								ď	8%	be
ပိ		 	II LA	B mit	Box					DRY GAS	GAS FRACTION (Fd)	
TRAVERSE	SAMPLING	STATIC	STACK	TEMP	VELOCITY	ORIFICE	GAS	GAS	GAS METER TE	ТЕМР	SAMPLE	IMPINGE
POINT PAL NUMBER	TIME B (min)	PRESSURE (in H20)	(oF)	(Ts) (oR)	HEAD (Vp)	DIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	N1 (9F)	AVG (Tm) (OR)	OUT (OF)	BOX TEMP (0F)	OUTLET TEMP (OF)
1	Q	7,	182		9/′	2.31	519.442	Be		84	252	٧٧
7	5.7	ц	182		ابي '	3.05		88		58	,25Q	から
2	5	4	283		.33	3.31		13/-		SS,	758	5-5-
4	75	4	18/2		, युत्र	3.76		 		55,	35.3	5.55
5	1	5:	273			3.7.3		7/6		36	35%	5.2
9	13.5	7,	×7.5		1,1,1	4.0%		78		100	255	00,
7	37	1,	373		90.	0.87		777		1/2/2	25 6	333
300	175	\	373		700	0.58		77		32	25 %	2
	30		الالا		, 0,5	70,70		1K		73	45/2	\$ 1
9)	750	- 1	1 / ×.		707	101		37		00	177	6.7
Tan.	275	n di	180		60,	1.0.1		07		30	257	1,8
	30(240)	1 1					539,0:0					1 1
										+		
				 								

6,3

B					PART	PARTICILI ATE SA	SAMPLING DATA SHEET	SHEET					
										18	ANBIENT TEMP		
	RUN NUMBER	1 6		SCHEMATIC OF STACK CROSS SECTION	CK CROSS S	ECTION	EQUATIONS						Ş
	ダ	2/5					OR = OF + 460	_		3	STATION PRESS		Ao.
-	DATE 917						L	۲,		·			200
	41 JUNE 0-1	18.0-1					H = 5130		사	ŢΞ	HEATER BOX TEMP	MP.	111 (48)
	PLANT PETIVER	TAKI MINAT						7	0				स०
	BASE									4	PROBE HEATER SETTING	SETTING	
	らっためへ ダイン	R BFS											
	SAMPLE BOX NO	JMBER								i i	PROBE LENGTH		
reduce	METER BOX NUMBER	MBER								ž	NOZZLE AREA (#TDIA	ATDIA	
	ow/om	7								ප	0,377		44.4
	,										481		
	3									ă	DRY GAS FRACTION (Fd)	ION (Fd)	
·····	TRAVERSE		1, RETATIC	STACK TEMP	ТЕМР	VELOCITY	ORIFICE	GAS	GAS METER	ETER TEMP	SAMPL	3	IMPINGER
5 64	POINT	TIME A (min)	PRESSURE (10 H20)	(oF)	(Ts) (°R)	HEAD (Vp)	DIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	N (0 F)	AVG OUT (Tm) (OF)	T BOX T TEMP	. ۵.	TEMP (OF)
7	~	٥	r,	185		51.	167	539.10	34			7	68
	7	2.5	3	185		. (5	3.3/		86	16	7.5.5		67
	3	5	3	135		0/,	3.36		66	1/6	\dashv		63
اسما	ų	15	3	びみ		.,3	1.90		₹01	7.3	1	1	۲.۶
	ک	01	3	341		0//	1.45		103	472	-		6.4
	٥	125	2	494		0//	1.46		10.3	93	+		6.5
	7	15	7	292		.67	٦/١		103	73	+		65
	80	175	3	7,7		700	220 80/		103	73	35	1	00
محاريد	9	27.5	,	2010		20,	0.73		100	93	2000 2000 2000 2000		67
يسيداد	-	35	-	288		50'	0.73		98	73	-		66
12/12	12	37.5	1	388		, 05	0.73		47	93			66
<u></u>		3~(42)						557,854					
	2450	- B 77 819											
		280											
٠	# # 77	1.59											
	Tm =	7											
	アクトは	38.412.5	743									+	
<u>سراب</u>					1							1	
d	OEU! FORM	9,											¥

HL FORM

	AIR POLLU	FION PARTICUL	ATE ANA	LYTICAL	DATA	
BASE	DA.	TE.		1	RUN NUMBER	
Clear	FS	21 June	89		()	_
OH HP			SOURCE NU Boil			
1.		PARTICU				
	TEM	FINAL WE		INIT	AL WEIGHT (@m)	WEIGHT PARTICLES (pm)
FILTER NUMBER		<i>(</i>), 5	5124	.2	873	,225]
ACETONE WASHINGS Hall Filler)	(Probe, Front		4661		,381Ø	. Ú 851
BACK HALF (II neede	od)		· · · · · · · · · · · · · · · · · · ·			
		Total We	ight of Partic	l culates Colle	ected	13102 am
II.		WATE	ER			
1	TEM	FINAL WE		INITI	AL WEIGHT	WEIGHT WATER (gm)
IMPINGER 1 (H20)		261)	ર (00	60.4
IMPINGER 2 (H20)		<u> </u>	λ	えの	Ç	22-4
IMPINGER 3 (Dry)		5	-	C	7	22-¢ 5,&
IMPINGER 4 (SIIIca Ge	1)	215.	8	30	00	15,8
	s		ight of Water			103 am
ш.		GASES	(Drv)			
ITEM	ANALYSIS 1	ANALYSIS 2	ANAL	YSIS 3	ANALYSIS 4	AVERAGE
VOL % CO ₂	10.4	10.4	10	1,4		10.4
VOL % 02	9.6	9.6	٥	7.6		10.4 9.6
VOL % CO						
VOL % N ₂						
	Yo	1 % N ₂ = (100% - %)	co ₂ .%o ₂ .	% CO)		

AMD FORM 651 REPLACES OFHE 20, MAY 78, WHICH IS OBSOLETE.

VISIBLE EMISSION C	DBSER	VATIC	N FO	MF		No.	ウ ₁
COMPANY NAME	OBSE	RVATION			START	TIME	END TIME
USAF	SEC	LJ	m 8	7_	121	14	
STREET ADDRESS OH & HP	MIN	0	15	30	45		COMMENTS
	1	5	10	10	10		
CITY A STATE ZIP	2	10	10	5	5		
PHONE (KEY CONTACT) A SOURCE ID NUMBER	3 *	5	5	5.	5		
Wundel Shocusher Brile #1	4	10	10	10:	5		
PROCESS EQUIPMENT COOPERATING MODE	5	5	5	5	5		
CONTROL EQUIPMENT OPERATING MODE	6	5	5	5	5		
\[\tag{\tau} \]	7	5	5	5	1		
CESCRIBE EMISSION POINT Steel Stack	8	5	5	5	5		
Steel Stick	9	5	5	5	5		
	10	5	5.	5	5		,
HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER Start // End	11	5	5	5	5		
DISTANCE FROM OBSERVER SIZIT STATE End Start Start End	12	5	5	5	15		·
	13						
DESCRIPE EMISSIONS Star End	14						····
EMISSION COLOR KOWA WHITE IF WATER DROPLET PLUME	15						
Stan Francisco End Attached DV/ Detached D POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	16						
Slart 0-5' End	17						
DESCRIBE PLUME BACKGROUND Start Star	18						
BACKGROUND COLOR SKY CONDITIONS .	19		•				
Stan Hullend Stanforthy Country	20						
WIND SPEED WIND DIRECTION / Start Start NE End	21						
AMBIENT TEMP WET BULB TEMP RH, percent	22		•				
Start 7.5 End · 14/3	23						
SECK SOURGE LAYOUT SKETCH Draw North Arrow Plume	24						
Sun 💠	25						
Wind -	26						
Emission Point	27				,		
	28						
(1).	29						
	30						
			NAME (P				
Observer's Position	OBSE	HVER'S	<u>s (V.</u> Signat)	<u>j4tte</u>	berg		DATE
1400	(',	me l	\mathcal{W}	Uta	, <u>)</u>	·	ZUTUNS"
Fun Location Line	11 .	ANIZATIO TEHL	,	.)	7		· · · · · · · · · · · · · · · · · · ·
ADDITIONAL INFORMATION	CERT	יף פודור					DATE 1710AC
66	1/1/1	US /T	1/ Can	bel	Bour	rel	11+WA

ACK NUMBER		SCHEM	SCHEMATIC OF STACK CROSS SECTION	OSS SECTION	EDUATIONS			AM	AMBIENT TEMP	
7	<u> </u>				OR = OF + 460	0;				न०
DATE 21 3	21 JUNE 89				513(3d.Co.A 3		12	STATION PRESS	In Hg
PLANT	PWERE PLYSALF	1	7		# #		Ts . vp	HE	HEATER BOX TEMP	Ro
BASE					,			स्	PROBE HEATER SETTING	
SAMPLE BOX NUMBER	L TTS NUMBER				1.tot	1. tot Chark - you	3	1	PROBE LENGTH	
			(Pretest 10.	110 test 100 K (2) 15" 14 - 6700 J	, 50 to 1		i	uı
ME ER BOX NUMBER	C C C C C C C C C C C C C C C C C C C		A LI		Port 1 /2 11				1022LE AREA (A)	sd ft
₩Ç/mÒ) cs [,	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7000 PM 01 200 200 200 200 200 200 200 200 200	ž Š	<u>ট</u>	13.30	
රී			1 302					DRY	Y GAS FRACTION (FJ)	(Fd)
TRAVERSE	SAMPLING	1 STATIC	STACK TEMP	\vdash	-	GAS	GAS METER	ETER TEMP	SAMPLE	IMPINGER
FOINT POINT	тімЕ Д(min)	PRESSURE (In H20)	(oF) (Ts) (OR)	s) HEAD		SAMPLE VOLUME (cu ft)		AVG OUT (Tm) (OF)		OUTLET TEMP (OF)
1345	0	Ý	388	0.05	0.73	558,139	9.4		\vdash	73
2	2.5	_	33g r	91.6	3.35		33	26		19
3	5	m	280	1/5	2.23		22/	77	\dashv	ن ان تع
4	2.5	જ.	273	(8),	1.25		20/	7,7	+	100
	36,	۲,	772	7,1	27/1		/0/		1970	ار ار ار
2	15/	5 70	34.7	30,	1,17		105	36	350	3.3
3 :	175	ج.	343	106	0.88		10.5	98		35
6	λc	,	1881	50'	0.73		401	18		35
01	32.5	1	168	60.	0.53		103	96	263	55
1 5171	3.75		330	30,	0.88		707	86	796	1000 1000
	30(51,)		27.85	/2/		575,971	4	9	X 2	3
	,									
			_	_	•				•	

OEHL FORM 18

T					PART	PARTICULATE SA	SAMPLING DATA	SHEET					
	RUN KUMBER	``		SCHEMATIC OF STACK CROSS SECTION	SK CROSS'S	ECTION	EQUATIONS				AMBIEN	AMBIENT TEMP	
armender.	\S. 1	42					OR = OF + 460	0			STATIO	STATION PRESS	90F
	12	56WF 83					1, 5130	5130-Fd-Cp-A 2	Tm				in Hg
****	PLANT							 ,	Ts · vp		HEATER	HEATER BOX TEMP	ផ្
	BASE	rewrite FLIBAI									PROBE	PROBE HEATER SETTING	
THE STREET STREET	C. L-F. A. SAMPLE BOX N	JUMBER									PROBE	PROBE LENGTH	
	METER BOX NU	MBER									NOZZF	بقاي	
	2	7									٤	,3,17	华
	m M										,	h8;	
	ပိ										DRY GA	DRY GAS FRACTION (Fd)	
-	TRAVERSE	SAMPLING	V. STATIC	STACK	TEMP	VELOCITY	ORIFICE	GAS	GAS		TEMP	SAMPLE	IMPINGER
/	POINT	TIME B (min)	PRESSURE (in H20)	(°F)	(Ts) (oR)	HEAD (Vp)	PRESS. (H)	SAMPLE VOLUME (cu ft)	N (96)	O (Ten)	OUT (oF)	TEMP (°F)	OUILEI TEMP (OF)
三三		0	3	386		, 72	1.76	16.515	/מנ.	. FE	98	300	60
	3	5.8	11	388		071	3.78			ji,	38	260	00
	3	7	7	383		,33	3.37		10,4		200	765	5.6
	25	25	=	34%		1,80	2.93		105) برد برد	266	15
	2	20/	7	336		1/3	1.76		707		\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	7665	(2.7)
	Ž (11	295		1,04	0.59		103		20/	260	6.5
	ລຂ	77 5	ሉ	334		, 64	0.59		0//		001	みこみ	64
<u></u>	6	30		797		40.	0.59		108		007	256	6.4
يولم پ	10	ر کر در	ره (1168		,06	0.88		10%	Ì	700	25.55	× 2
13.2	17	375	418			103	1.33		501		00/	765	42
-		3015169)						595,546					
				1/5			1,115			1,0/			
اجساء	PSTS =	8.2914											
.	75 =	162											
	1 2 T	5/0/2					- FEET	4 20 (5)					
	107 ×	17	y3										
ā	OEM! FORM	01		7									

	AIR POLL	UTION PARTICUL	ATE ANA	LYTICAL	DATA	*****	
BASE	1	DATE		İ	RUN NUMBER	······································	
Clear	AFS	21 June	8 <u>9</u>	NOT D		3_	
BUILDING NUMBER				nte #	(
1.		PARTICUI					
	TEM	FINAL WE	IGHT	INITI	AL WEIGHT (gm)	WE	IGHT PARTICLES (pm)
FILTER NUMBER		0,64	145	٠, كا	872	,	.3573
ACETONE WASHINGS Half Filter)	(Prohe, Front	95,5		95	5,523		0680
BACK HALF (II neede	od)						
		Total Wei	ght of Partic	ulates Colle	eted	,	4253 em
11.		WATE		r			
1	TEM	FINAL WE	1GHT	INITI	AL WEIGHT (gm)		WEIGHT WATER
IMPINGER 1 (H20)		5.70	D	2	00		76. j
IMPINGER 2 (H20)		210	;	a	00		10.0
IMPINGER 3 (Dry)		a		(2		2.4
IMPINGER 4 (SIlica Ga	51)	212.	2	<u> </u>	2c		12.2
		Total Wei	ght of Water	Collected			914 am
111.		GASES	1			γ	The second secon
ITEM	ANALYSIS 1	ANALYSIS 2	ANAI	L YSIS 3	ANALYSIS 4		AVERAGE
VOL % CO ₂	11,6	11.4	/1.	4			11,5
۷0L % 0 ₂	11,6	8,6	8.	16			8.5
VOL % CO							
VOL % N ₂							
		Vol % N2 = (100% · % (0 ₂ - % 0 ₂ .	. % CO)			

								<u></u>
COMPANY NAME		1	NOITAVE		ກ	START		END TIME
ISAP		SEC	77	N 80	-1		253	L
STREET ADDRESS CH & HP		MIN	0	15	30	45	(COMMENTS
•		1	10	10	10	5		
CITY- 4	STATE , ZIP	2	5	-	10	10		
CITY DOWN AFR	STATE ZIP	3 ·	سر	5	ب سر	5		
PHONE (KAY SCHTACT)	SOURCE ID NUMBER	 	5_	-	<u>دا</u>			·····
PHONE (KRY CONTACT) WOMEN SKORMSKEY	Brilen#1	1	5	5	5	5		
PROCESS EQUIPMENT	OPERATING MODE	5	5	5	5	10	Ì	
Coaldned Soil	en 90 10ts/hr	6	10	10	10			
CONTROL EQUIPMENT	OPERATING MODE	7	70	T	10	10		
. Cerdice Separate	It moment		5	5	15	5	<u> </u>	
DESCRIBE EMISSION POINT		8	5	5	5	5		
Steel Stuc	<u> </u>	9	5	5	15	10		
		10	5	5.	15	5		
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER	:	 	+	1	12		
100	Start /07) End	<u> </u>	5	5	5	15		
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER	12	5	5	5	15		
Start 307) End .	Start N End	13	[
DESCRIBE EMISSIONS	•	14		1		1		
Siza lotting	End IF WATER DROPLET FLUME	15	 	 	╁	 		
EMISSION COLDA . J) Standy WWW.	Attached D N/A Detached G		ļ	 	ļ	 	ļ	
POINT IN THE PLUME AT WHICH OPAC	TY WAS DETERMINED	16	<u> </u>	<u> </u>				
Start 0-5	End	17						
DESCRIBE PLUME BACKGROUND		18		1	1			
Stan She	End		 	 	 	 	 	
BACKGROUND OOLOR	SKY CONDITIONS SIAN PARTY CONTINUENCE	19	<u> </u>	<u> </u>	<u> </u>	 	<u> </u>	
Sian Blue whiters		20			1			
Y/IND SPEED	WIND DIRECTION Stan NE End	21						
Start 0 - SmylEnd	Start NE End SH, percent	22	 	+	i	 	 	
Start 75 End ·	L10	11	}	 		1	 	
SECK SOURCE LA	YOUT SKETCH Draw North Arrow	23	—	 	1	<u> </u>	 	
with C		24						
Sun 💠	ψ	25					-	
Wind -		26	1					
	6/	11	+	-	+	+ -	 	
	Emission Point .	27	 	-			 	
	,	28		1				
		29						
1		30	1	1	<u> </u>			
/		j L						
		11	LARVER'S	NAME (the	1 / 4 6 4	• •
	Observer's Position			S SIGNAT	URE .	1126	184	DATE
	1101	\parallel C	has	1 7	·at	til.	\neg Γ	21JW f
1	140°	11 -	ANIZATI	ON ,			<u> </u>	
Sun Lo	intion Line		FOFF		ra_			T
ADDITIONAL INFORMATION		7177	TIFIED E	"Air	C. 1	(Brand	PATE MAX 8
§	70	11 18	1 M	1111	- (m_1	V1~1	un aren	, , ,,,,-0

PRELIMINARY SURVEY DATA SHEET NO. 2 (Velocity and Temperature Traverse) 21 JUNE 89 BASE CLEAR AF 5 #1 INSIDE STACK DIAMETER Inches STATION PRESSURE 29.05 In Hg STACK STATIC PRESSURE -,12 In H20 9 % Mistura SAMPLING TEAM STACK TEMPERATURE (0F) TRAVERSE POINT NUMBER VELOCITY HEAD, Vp IN H20 :14 a-13 261 2 J ,16 253 281 271 281 ,15 283 ,12 283 . 1 Ù 364 ,10 285 110 284 ع ٥, 9 283 , C L 283 10 .06 261 II.06 281 12 106 bre 11/50 2 # 1 Pin 0.415 27.07 7 281 47,06 6 AVERAGE

Appendix G Field Data, 22 Jun 89

RUN NUMBER		T T は T し と	THE CAL	SCHEMATIC OF STACK CROSS SECTION						AMBIENT EMP		
	•	(E.J.)	C 10 10 7 11		ECTION	EQUATIONS				!	T X	
_	1/2	V. 	たりクメ	SEALL OF	TRM/	OR = OF + 460	<u>.</u>					Яo
		ა 	10/2	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		L	١			STATIO	STATION PRESS	
23 Jun.	7. 53 27	` 			7.//	H = 5130	5130·Fd·Cp·A 2 7	Tm. Vo		Š	A7.25	in Hg
	Houth.	- -	Ľ				 1			HEATE	HEATER BOX TEMP	ţ
BASE	3	~				7 the	かいらしない	$\tilde{\gamma}$		PROBE	PROBE HEATER SETTING	NG
Elect A	ich AFS	~~				1817	; !	`	7			
SAMPLE BOX	NUMBER	J				gra leuk (gra leuk (hout (OK"H))7 U 75	-	PROBE 9	PROBE LENGTH	
METER BOX NUMBER	IUMBER	<u> </u>				1 1 1 10	10- 10- 10- 10-	(100 c)		NOZZLE	NOZZLE AREA (A) 2017	E .
						103/ /46/-		-	T	1	377	sq ft
E S		**	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\						-	<u>;</u>	Je Sel	
ů		7)	Incter B	Ber		10% no store	ņ			DRY GA	DRY GAS FRACTION (Fd)	କ
TRAVERSE	-	VASTATIC	STACK TEMP	TEMP	VELOCITY	ORIFICE	GAS	GAS	GAS METER TEMP	MP	SAMPLE	IMPINGER
POINT	TIME A (min)	PRESSURE (fn H20)	(oF)	(Ts) (oR)	HEAD (Vp)	DIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	IN (OF)	AVG (Tm) (°R)	OUT (o.F.)	BOX TEMP (°F)	OUTLET TEMP (0F)
11.	0	٤	ME		. (5	2.10	576.485	73		7.2	337	5.5
み	7.5	3	14 E		117	338		14		77	341	50
Ж	5	3	365		9/,	2.56		7.5		77	243	۲,
2	7.5	14	474		. 15	3.11		77		73	247	2.1
1,	0)	۲, ۲	376		,13	1.83		23	1	٤;	954	5 3
) د	12.5	Š	37.7		,16	\sim		7,		7	X#C	55
/	15	rf, -	376		50,	0.70		17		44	464	350
0	3,0		27.6		200	2 7 6		7.7		4,8	26.4	5.7
0)	7 77	-	7,1,00		,07	· .		47		1/2	265	57
11		ૡ	373		g. o.	. lp.		7.7		70	365	25
	シゼ	૪	373		ő o ·	1.13		73	``	70	366	55
	3:(214)						615.173					
		•										
						,5						
										+		
										1		

OEHL FORM 18

(M) = 75

RUN N'MBER DATE 2.2. J.m. 3 PLANT BASE SAMPLE BOX NUMBER WETER BOX NUMBER QW/QM Co	3 %	ЗСНЕМАТ	SCHEMATIC OF STACK CROSS SECTION	K CROSS S	FATION					AMBIEN	AMBIENT TEMP	
2 June BOX NUMBER					;	EQUATIONS						
2 June BOX NUMBER BOX NUMBER						OR = OF + 460	O.			STATIO	STATION PRESS	96
PLANT BASE SAMPLE BOX NUMBER METER BOX NUMBER Qw/Qm						H = 5130	5130-Fd-Cp·A 2					in Hg
BASE SAMPLE BOX NUMBER METER BOX NUMBER Qw/Qm						1		Ts . vp		HEATE	HEATER BOX TEMP	į
SAMPLE BOX NUMBER METER BOX NUMBER Qw/Qm										PROBE	PROBE HEATER SETTING	40
METER BOX NUMBER Qw/Qm Co										PROBE	PROBE LENGTH	
Ço Co										NOZZL	NOZZLE AREA (A)	in
రి										රි		sq ft
										DRY GA	DRY GAS FRACTION (F.2)	c:
-	1	ATIC	STACK TEMP	EMP	VEI OCITY	ORIFICE	GAS	GAS	GAS METER TE	TEMP	SAMPLE	IMPINGER
IN POINT TIME	ME PRESEGRE in) (in H20)	Sedre H20)	(oF)	(Ts)	HEAD (Vp)	DIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	N (9F)	AVG (Tm) (R)	OUT (OF)	BOX TEMP (°F)	OUTLET TEMP (0F)
b		3	27.1		111:	1 53	615,173	, <u>,</u> ,		6.4	273	57
× ×			274		1,1,	1.35		71		69	360	53
3 5		3	366		٠١٤)	(97		7.1		63	55.7	54
	75	3	474		ه۱.	167		72		80	260	56
اره		3	376		30,	1.11		7,3		30	353	26
	12.5	1	277		, o	17.7		73		68	260	58
		4	375		70,			73		6.9	360	200
8 175		7	273		100	0.83		73		e co	357	58
7 20		K	373		70'	0.34		20	 	68	35.9	5.8
7		~	172		90,	0.84		17	†	100	35.4	200
<u> </u>			369		،0ر ا			70			J.	AS
	- -		595		507	0.11	033 OSO	22		/ 0	2 6 5	27
20.	, ductors				V	H	000000000000000000000000000000000000000					
			からお		ルをひ	- 1:34 1	35		The second			
		; ;	273,D	9,8								
						6.9	11/1/6	F	17=1			
					1 0.75	1	7.6124					
						ME	er Volum	,	35. Z	0 %		
		1										

OEHL FORM 18

	AIR POLL	UTIC	ON PARTICULA	ATE ANA	LYTICAL	DATA		
BASE (/e ur A	1	DATE ス	2 June	<u></u>		RUN NUMBER		
BUILDING NUMBER	<u>''</u>			SOURCE NUI	MBER	*		
I.			PARTICUL	LATES				
	ITEM		FINAL WEI	IGHT	ІНІТІ	AL WEIGHT (gm)	W	EIGHT PARTICLES
FILTER NUMBER			0.489]	0.0	2914	(\$.1977
ACETONE WASHINGS Half Filter)	S (Ptobe, Front		93.67	198	9.3.	63 <i>2</i> 2		Ø.\$476
BACK HALF (II need	(ed)							Y
			Total Wei	ght of Partic	:ulates Colle	octed		. 2453 ==
II.	***************************************		WATE	R	T			
	ITEM		FINAL WE (gm)	IGHT	INITI	IAL WEIGHT (gm)		WEIGHT WATER (gm)
IMPINGER 1 <i>(H20)</i>			270)	2	00		70
IMPINGER 2 (H20)			3.18	3	20	00		18
IMPINGER 3 (Dry)			2	۷.	٥)		2
IMPINGER 4 (SIIIca G	iel)		211	. &	30	, 0		11.8
				ight of Water				101,8 gm
ш.			GASES (1		*		1
ITEM	ANALYSIS 1		ANALYSIS 2	ANAL	LYSIS 3	ANALYSIS 4		AVERAGE
VOL % CO2	133		13 3	13-3	3			13.3
VOL % O ₂	6.7		6.7	6.	7			6.7
VOL % CO								
VOL % N ₂								
		Vol	% H ₂ = (100% - % (CO ₂ - % O ₂ ·	- % CO)	 		I

VISIBLE EMISSION OBSERVATION FORM

No.

					PART	37.	SAMPLING DATA SHEET	, SHEET				
	RUN NUMBER	1,	SCHEMA	SCHEMATIC OF STACK CROSS SECTION	K CROSS SI	ECTION	EQUATIONS			AMBI	AMBIENT TEMP	
	+	1/2					OR = OF + 460	6		STAT	STATION PRESS	POF
		22 June 87		١				7	: :	-	29.25	in Hg
	PLANT		~~; 	[/ _c			# E	00	Ts. vp	HEAT	ER BOX TEMP	1
	BASE		~ T					•	Ü	PROE	PROBE HEATER SETTING	Jo SNI
	SAMPLE BOX NUMBER	UMBER	-				1.tot (4	fitot theck - Usock	χ		PROBE LENGTH	
	-		<u> </u>				pre leak	Pir leat thank @ 15"4 - 400 d	-"H - (1100	!	96	Ë
	METER BOX NUMBER	<i>ј</i> мвея			j			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	", o - /	·····	NOZZLE KREK ZAJ	הית הית
	Qw/Qm		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	2			post leak	post leak theck (g' C ng - crosser	3,700 - 50	ප	184	li bs
	රී		7	Umeter hox	لر م					DRY	DRY GAS FRACTION (Fd)	Fd)
	TRAVERSE	F	ASTATIC	STACK TEMP	TEMP	VELOCITY	ORIFICE	GAS	GAS ME	7취	SAMPLE	IMPINGER
· /-	.a.	ТIME [5 (min)	PRESSURE (in H20)	(0F)	(Ts) (oR)	HEAD (Vp)	PRESS. (H)	SAMPLE VOLUME (cu ft)	- (FO)	Avg OUT (Tm) (oF)	HOX TEMP (°F)	OUTLE I TEMP (OF)
から	-	0	Ķ	277		111	1.53	6.32.415	60	৯০	2.34	69
	8	3.5	3	374		h]'	567		11	69	336	67
	٤	5	۲,	308		1.3	1.69		73	69	273	63
	<u></u>	7.5	2	17.5		1):	1.55		77	2,0	2000	700
	٠,	7.21	38	27.8		x o.	41,1		77	70	261	60
	7	5!	ત	377		,06	0.84		77	U.	178	19
	25	175	ሌ	275		ىن.	0.64		76	70	364	99
	f	- 1	4	374		-0 (c	0.8d		1/2	#	X = X	200
	aj	25.55	~6°C	۲/۰× ارتز		20,	0.70		3/6	7,2	267	623
ì		37.5	1	369		201	0.70		74	70	ゲッグ	09
/ ,		30(5/6p)						5119.415				
									,			
		1								-		
	OEHL TORM	α										

OEHL FORM 18

### Property Prop			agnus I	A T 10 OE CYAP	PARTIC	1	SAMPLING DATA SHEET	SHEET			AMBIENT TEMP	TEMP	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	RUN NUMBER	~ ~	SCH EM.	ATIC OF STAC	۲ CROSS SE الرورات //ار	N 0 1 0 1	EQUATIONS OR = OF + 46	-					२०
FOX NUMBER 1		(.3						2			STATION	4 PRESS	in Hg
$\frac{\text{FLE BOX NUMBER}}{\text{The BOX NUMBER}} = \frac{1}{\sqrt{12}} \frac{1}{\sqrt{12}$,	~»,				#				HEATER	BOX TEMP	न्०
TER BOX NUMBERS Fig. 8, L,	4SE				,		7451 (43	1			PROBE !	HEATER SETTIN	b
The box number $\frac{1}{3}$ and	MPLE BOX N	чижвек					pre leute		1		PROBE I	леметн 946	.5
Total Tot	TER BOX NI	UMBER	T				jest leu L	(hock (w) -			NOZZLE	AREA (A	
The first same and state The first same and	w/Qm			Ž,							රී	, 8 4	
SAMPLING	රී		7		ري دي		<u>^</u> `				DRY GA	S FRACTION (Fd)	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	STACK 1	EMP	VELOCITY	ORIFICE	GAS	GAS		ΜĐ	SAMPLE	IMPINGER
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	TRAVERSE POINT NUMBER		PRESSURE (19.11.20)	(oF)	(Ts) (oR)	HEAD (Vp)	PRESS.	SAMPLE VOLUME (G) (f)	IN (OF)	AVG (Tm)	out (oF)	BOX TEMP (oF)	OUTLET TEMP (OF)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$.,		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	374		,15	8.03	547,415	7.	75	70	764	ر /
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			1,1	17.4		(A)	3.1.1		13		7/	264	((
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			14	369		77'	048		77		77.	253	5.3
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		5-:	7	シしん		,15	311		70		(A)	356	~
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		0/	7	3.78		13	1.68		20		4	375	500
3 376		77	T/	3789		3/0	127		, , , ,		17.7	3.5 3	67
3 375 .007 0.97 81 75 354 1 375 .007 0.97 81 81 77 359 2 371 .007 0.97 82 76 357 3 371 .007 0.09 83 76 357 363 AH×1.25 7641, 7.8886		1,2,	۸,	3/6		200	0.5.0		203		75:	25.5	67
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		25	6-	\$75		40,	0.57		18		755	450	67
3.371 1.00 6.1357 6 3.371 1.00 6.17.361 83 76 357 6 3.63 3.14 1.25 7.6424 7, 8886 76 74 7.18 866 76 76 77 77 77 77 77 77 77 77 77 77 7		ンご		1375		۲0٠	0.93		13		75	256	66.
3.37 1.00 66,7,301 $= 35$ 6 $= 35$ 6 $= 35$ 6 $= 35$ 6 $= 35$ 6 $= 35$ 7 $= 76$		75.	ų	1,75		201	0.34		83		7/7	457	
15=275 1H+1.25 W6.1,561 Tm= 74 15=275 1 P5.75 = 7.4424 7.8886 178=424 1.364me = 511.89		37.5	る	371		107	7.00	1	X 33		9/	W	-
275 TP575 = 76424 7, 888c		32(5/42)			1	n //		21.3	\ \-				
-275 TP5TS = 7-6124 7, 888c				48.8		411			<u> </u>				
1 P575 = 7-6424 7, 8 4 8 C			1	10									
(8,1/5 = 51/8)						1 83	75 7	8 12 +	32				
(ec 1/3/www = 51/8)													
1er Vilame = 271,0 1											1		
							3	1. (M.)	1				

OEHL FORM 18

	AIR POLL	UTIC	N PARTICUL	ATE ANA	LYTICAL	DATA		· · · · · · · · · · · · · · · · · · ·	
BASE		DATE				RUN NUMBER			
Cleur 1	1 =5	<u> </u>	Sune 8!			2			
BUILDING NUMBER				SOURCE NU	MBER Posti	, ⇒)			
1.			PARTICU	LATES		*			
ı	ITEM		FINAL WE		ТІМІ	IAL WEIGHT (gm)	w	EIGHT PARTICLE (gm)	ES
FILTER NUMBER			,46	13	0.2	2909		.17ØH	
ACETONE WASHINGS Hall Filler)	i (Probe, Front		102,	7824	103.	7366		<u>, 1764</u> , 6458	
BACK HALF (If needs	ed)								
			Total We	ight of Partic	ulates Colle	peted		,2162	gm
II.			WATE	ER			·		
	TEM	.	FINAL WE (gm)		INIT	AL WEIGHT (gm)		WEIGHT WATER	
IMPINGER 1 (1120)			25 270		ス	00		54	
IMPINGER 2 (H20)			224 254		3.	90		24	
IMPINGER 3 (Dry)			1)		ł	
IMPINGER 4 (SIIIca G	o()		213	9	30	U		13,8	
			Total Wei	ight of Water	Collected			92.8	ğт
111.			GASES	T					
ITEM	ANALYSIS 1		ANALYSIS 2	ANAL	-YSIS 3	ANALYSIS 4		AVERAGE	
VOL % CO2	13.3		3 3	13 5				13.3	
VOL % 02	6.7		6.6	6.4	,			6.7	
VOL % CO									
VOL % N ₂			-						
		Vol %	N ₂ = (100% - % (co ₂ .%o ₂ .	% CO)				

[CONOMINATION		(055	5 1.41.50				NO	
COMPANY NAME			AVATION 7 TI	i date Jav - <i>g</i> i	6	START 125		END TIME
STREET ACORESS		SEC	}					1306
CHAHP		MIN	0	15	30	45		COMMENTS
•		1	5	15	15	5		•
CITY A	STATE ZIP	2	5	5	5	7		
Clean HIS	1 RK	3 ·	-	5	5	2		
PHONE (KEY CONTACT)	SOURCE ID NUMBER	1	5	1		12-1		
- Company		 	_	15_	5:	5		
PROCESS EQUIPMENT	OPERATING MODE	5	5	5	5	.5		
CONTROL ECUIRMENT	OPERATING MODE	6	5	5	5	5		
. Ceclme segina	itos someral	7	5	15	5	5		
DESCRIBE EMISSION POINT	,	8	5	15	5	5		
Strel Stack		9	سر	5	5	7		
		10	2	5.		ا سے		
HEIGHT ABOVE GACUND LEVEL	HEIGHT RELATIVE TO OBSERVER		5	٠.	3	15		'
(0)	Stan 926) / End	11	5	5	5	5		***
DISTANCE FROM ÖBSERVER	DIRECTION FROM OBSERVER	12	5	5	5	5		
	Start End	13						
DESCRIBE EMISSIONS SIZE FATTURE	End	14						
EMISSION COLORY	IF WATER DROPLET PLUME	15						
sanbririle Methote	Attached D. U/A Detached D	16						
POINT IN THE PLUME AT WHICH OPAC		-						
Stan 0-5'	End	17						
DESCRIBE PLUME BACKGROUND Start Start	End	18						
BACKGROUND OCLOR	SKY CONDITIONS ,	19						
Stanble Willend	Stanfar-fly Clouding	20					-	
WIND SPEED SIAN (0-) Suntend	WIND DIRECTION Start / End	21						
AMBIENT TEMP	Start	22		•				
Start 68 End .	12/0							
Stack SOURCE LA	YOUT SKETCH Draw North Arrow	23			·			
Pitume		24						····
Sun	Θ	25						
Wind ->		26						
_ > \	Emission Point	27						
1		28						
	10	29						
	-	30						
		OBSE	RVER'S	NAME (PF	(TNIF			
	Observer's Position		mit			38 ER	<u>J</u>	, x
	1	3/ 5/	EVER'S S	SIGNATU	}* }+-	· 3	•	SS JUN &
	140**	OPCA	MIZATION	1 /	~ ` U		· ·	1227000
Sun Loc	alion Line .	A	-0 b }	4L/6	CH)	1744
ADDITIONAL INFORMATION	}	CERT	FIED BY	hur.	Li	1 600	ر ا	DATE
	<u>[</u>	1 1 4	√/U	זוי \. <i>\\</i>	AT 14 L	V U /	1 01	12000

				PART	ICULATE	SAMPLING DATA	SHEET				
RUN NUMBER		SCHEM	SCHEMATIC OF STACK CROSS SECTION	C CROSS SE	CTION	EQUATIONS			AMBI	AMBIENT TEMP	
	3 1/2		80,000 165	5/hr		OR = OF + 460	6		7 7 7 2	STATION DRESS	Po
OATE ス	(3 June &)			;			- 5130, Ed. Cp. A 3 2 7			37 25	in He
PLANT			<u></u>			# H	•	Ts . Vp	HEAT	4	
BASE						Pitot theck	eck - 610.2)	· · ·	PROB	PROBE HEATER SETTING	NG NG
SAMPLE BOX NUMBER	чимвея					Pratuk	Prabuk Check @ 15" Hy	1		PROBE LENGTH	
METER BOX NUMBER	имвея			1		post leak	Post teck thee less "Hy	"Hz - 60.00		1 7 7	10 V
Qw/Qm			<u></u>	8			a		ථ	181	ž
ပိ			¥ 	meter be	,				ORY	DRY GAS FRACTION (Fd)	ভ
TRAVERSE	SAMPLING	VECSTATIC	STACK TEMP	EMP	VELOCITY	ORIFICE	GAS	GAS METER	ER TEMP	SAMPLE	IMPINGER
POINT	TIME (min)	PRESSURE (in H20)	(9F)	(Ts) (oR)	HEAD (Vp)	DIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	OF) (OR)	(oF)	BOX TEMP (°F)	OUTLET TEMP (0F)
	3		27		۲/,	1:69	178.63	-	' `	234	.5-8
12	2.5		11/2		1.13	3.68		36	76	1334	نېړن
3	5	ሉ	ふつの		, 1 li.	35°E		333	76	33%	541
11	7.5	×	37c		116	3.36		12	7	243	24
5,	31	ત્	277		1,1,7	1,75		D 30	76.	944	200
y	12.5	₹-	2) 2	+		557		10	1/6	ないない	000
2 3	1.5	4	1/1/12		100,	700		20.00	77	755	385
6	7.0		272		\0\v	1		83	77	7.57	8.8
2)	2.4%		272		:04			òβ	76	257	57
11	15		111		167	0.47		Rc.	77	353	8.5
5	37.5	-	273		801	1.14		82	77	264	35
	306561										
									-		
									1		
OEHI FORM	1 18										

DEHL FORM 18

					TAK	I COLA I E SA	SAMPLING DATA SILE	1111					
	RUN NUMBER	1,3	SCHEMA	SCHEMATIC OF STACK CROSS	CK CROSS 3	SECTION	EQUATIONS				AMEJENT TEMP	TEMP	
		3 /2					OR = OF + 460				STATION PRESS	PRESS	OF
	DATE 3	the sit						5130.Fd.Co.A 2					in Hg
	PLANT	1						·	Ts . vp		HEATER BOX	вох темр	ង o
	BASE										PROBE H	PROBE HEATER SETTING	
	SAMPLE BOX NUMBER	UMBER									PROBE LENGTH	ENGTH	
	METER BOX NUMBER	MBER									NOZZLE	AREA (A)	ıu
	ow/Om						والمراجعة				Cp		sq ft
	ర										DRY GAS	DRY GAS FRACTION (Fd)	0
	30000000	Sarranga	STATIC	STACK TEMP	TEMP	VELOCITY	ORIFICE	GAS	GASM	GAS METER TEMP	45	SAMPLE	IMPINGER
:	POINT , NUMBER	(min)	PRESSURE (10 H20)	(°F)	(Ts) (°R)	HEAD (Vp)	OIFF. PRESS. (H)	SAMPLE VOLUME (cu ft)	N (9F)	AVG (Tm) (oR)	out (oF)	BOX TEMP (0F)	OUTLET TEMP (°F)
ر د		3	d	12.74		111	1.75		96.		77	768	54
	2	2.4	l į	1274		۲1,	1, 94		22		77	2.64	5.4
84	.ر	5	۲	71/2		113	1, 2,5		2.2		186	136	5.5
1	11	75	K	377		1, 1,	7.5.7				17	36.4	3 3 2
	\ <u>\</u>	0/	4	10.7% 10.7%		۲0,	1.38		13 13 13 13 13 13 13 13 13 13 13 13 13 1	-	127	37.7	シスマ
	1,-	57	80	276		\$0, \$0,	7/ /				97	365	09
	, %	1,75	,	275-		. 96.	6,83.		23		77	267	0
	7	2.5)	<i>374</i>		50'	0.71		炎,		ング		6/
	11	5.54		573		,00	C. R.C.		7.3		8,0		6.3
(\	25	<u></u>	373		,65	0.1		13/3	3	200	26.5	67
,		2.,754.0	7	2/4		۲۵۶	A/ 50	704.528				si l	
				The second			in			M			
			15.	326		V	포		1/2 1	03			
						250	 = 8'	1000					
											-		
										1 1			
							ર પા/	121 10/K	2)	= 56.	759		
_	1003	Ş		T					1	1	1		

OEHL FORM 18

	AIR POLLUTION PARTICULATE ANALYTICAL DATA							
Cleur A	62	DATE	2 June	49		RUN NUMBER		
BUILDING NUMBER	(1)		2 June	SOURCE NU	MBER			
l			PARTICU	LATES				
	TEM		FINAL WEIGHT I		ТІМІ	IAL WEIGHT (4m)	, v	(gm)
FILTER NUMBER			,449\$		0.	2972		.1518
ACETONE WASHINGS Hall Filter)	(Probe, Front		98,7157		98	1,6686		.04639
BACK HALF (II noode	od)							
		· **;	Total We	ight of Partic	ulates Colle	octed		,1987 am
11.			WATE	ER				
	TEM		FINAL WE		INIT	AL WEIGHT		WEIGHT WATER (gm)
IMPINGER 1 (H20)			269	5	2	70		65
IMPINGER 2 (H20)			213	2	20	O		12
IMPINGER 3 (Dry)			3		()		2
IMPINGER 4 (Silica Gol)			ā171,9 200) C	14.9		
			Total Wei	ight of Water	Collected			93.9 am
111.		,	GASES	(Dry)				
ITEM	ANALYSIS 1		ANALYSIS 2	ANAL	YSIS 3	ANALYSIS 4		AVERAGE
VOL % CO ₂	13.3		13.3 132				13 3	
VOL % 0 ₂	6.6		67	6.	Ų			67
VOL % CO								
VOL % N2								
		Vol %	N ₂ = (100% - % (CO ₂ .% O ₂ .	% CO)			

AMD FORM 651 REPLACES OFHL 20, MAY 78, WHICH IS OBSOLETE.

PRELIMINARY SURVEY DATA SHEET NO. 2 (Velocity and Temperature Traverse) BASE CLFUBR 22 JUNIE 89 BOILER NUMBER INSIDE STACK DIAMETER 83 Inches STATION PRESSURE 29 25 In Hg STACK STATIC PRESSURE -,08 In H20 SAMPLING TEAM √ Vp TRAVERSE POINT NUMBER VELOCITY HEAD, Vp IN H20 STACK TEMPERATURE (0F) 371 767 ·tt 118 2 271275 .+0 .23 42,22 375 D78 4 110 277 .16 , /2/ **み76** ___ ,00 **274** .06 273 9 273 · 0 છ 10 272 09 , 10 271 17 . 11 271 hue 13 24 1/20 1/15 34695/10 27/ Dia: 03865 Actual = 0.3.77 AVERAGE

Appendix H
EPA Method 9 Certification

The Texas Air Control Board Certifies That

CHARLES W. ATTEBERY

Has completed a course conducted by The Texas Air Control Board and has met the requirements for evaluating visible emissions.



September 15, 1989
This Certificate Expires

March 17, 1989

Appendix I
Emission Calculations

XROM -MI	ETH 5°	XROM "I	METH 5"		SF 84
RUN HUMBER 1.1808-	RUN	RUN NUMBER 1,2000	RUN	XRON "N	ETH 5"
METER BOX Y?		METER BOX Y?		RUN NUMBER -1.3000	RUH
1.0020 DELTA H?	RUH	1.0020 DELTA-H?	RUN	METER BOX Y? 1.0020	nuu
1.9108 BAR PRESS ?	RUK	1.9100 BAR PRESS ?	RUN	DELTA H?	RUH
29.2000	RUN	29.2000	RUN	1.9100 BAR PRESS ?	RUN
METER VOL ? 34.5410	RUN	METER YOL ? 43.0428	RUN	29.2000	RUN
HTR TEMP F?		MTR TEMP F?		METER VOL ? 43.6700	RUN
99.0000 % OTHER CAS	RUN	100.0000 % OTHER GAS	RUN	MTR TEMP F? 96.0000	
REMOVED BEFORE DRY GAS METER ?		REMOYED BEFORE DRY GAS METER ?		STATIC HOH IH ?	RUN
PRI GRO HETER :	RUN	THE GOOD HEICK !	RUN	1300 STACK TEMP.	RUK
STATIC HOW IN ?	DUU	STATIC HOW IN ?		297.0000	808
1300 STACK TEMP.	RUH	1300 STACK TEMP.	RUK	ML. WATER ? 88.0000	RUN
293.0000 ML. WATER ?	RUH	294.0000 ML. WATER ?	RUN	00.0000	Kui
102,0000	RUN	92.0006	-RUH	% CO2? 8.0000	RUN
% C02?		% CO2?		% OXYGEK?	Kine
9.0000 % OXYGEN?	RNN	8.8000 % OXYGEN?	RUN	11.0008 % CO ?	RUH
18,0000 % CO ?	RUK	10.2088	RUN	0.0000	RUR
0.0800	RUN	% CO ? 0.0000	RUN	MWd =29.72	
MOL WT OTHER?		MOL WT OTHER?		MK-WET=28,64	
8,0000	RUN		RUN		
MWd =29.84 MW WET=28.30		MWd =29.82		SQRT PSTS ?	
UB MC1-20,38-	-	MM-WET=28,66		9.5940 Time Min ?	PUH
COST DOTE A		0007 007. F		69.0999	RUH
SQRT PSTS ? 7.5978	nu.	SQRT PSTS ? 9.1975	nziu	NOZZLE DIA ?	
TIME MIH ?	RUN	TIME MIN ?	RUH	.3778 STK DIA INCH ?	RUH
• • • •	RUN	68.9999	RUN	83.0000	RUN
	RUH	NOZZLE DIA ? .3770	RUN	* VOL MTR STD = 40.7	40
STK DIA INCH ?	VAII	STK DIÁ INCH ?	1(04)	STK PRES ABS = 29,	
83.0000	RUK	83.0000	RUH	YOL HOH GAS = 4.14	
* YOL MTR STD = 32.05	7	* VOL MTR STD = 39.8	974	% MOISTURE = 9.23	۸.
STK PRES ABS = 29.15	; 9	STK PRES ABS = 29.		MOL DRY GAS = 0.900 % NITROGEN = 81.00	
YOL HOH GAS = 4.80	•	YOL HOH GAS = 4.33		MOL WT DRY = 29.72	
% MOISTURE = 13.83		% MOISTURE = 9.86		MOL NT NET = 28.64	
MOL:DRY GAS = 0.870		MOL DRY GAS = 0.98	32	VELOCITY FPS = 23.8	33
% HITROGEH = 81.00		% HITROGEN = 81.08)	STACK AREA = 37.57	
MOL HT DRY = 29.84		MOL WT DPY = 29.82		STACK ACFM = 53,720	
MOL HT HET = 28.38		MOL NT NET = 28.66		* STACK DSCFM = 33,18	
YELOCITY FPS = 18.98		YELOCITY FPS = 22.		% ISOKINETIC = 99.	26
STACK AREA = 37.57 STACK ACFM = 42,798,		STACK AREA = 37.57			
STACK DSCFM = 42,798,		* STACK BSCFM = 51,48 * STACK BSCFM = 31,7	-	-CHE AF FIRE	
% ISOKINETIC = 101.7	, 74	* 180KINETIC = 10		END-OF FIELD DATA	
101,1	v	a requiring a 10	1107		

20 June Emission Calculations

XROK "MASSFLO"	XROM "MASSFLO"	XRON *MASSFLO*
RUN-KUMBEP	RUN NUMBER	-RUN NUMBEP
1,1990 PUM	1.2000 RUN	1.3000 RUN
VOL MTR STD ?	VOL NTR STD ?	VOL MTR STD ? 48.7490 RUR STACK DSCFM ? 33.182.0000 RUR FRONT 1/2 MG ? -515.7000 RUR BACK 1/2 MG ? 0.0000 RUR
F GR/DSCF = 0.1643	F GR/DSCF = 0.1580	F GR/DSCF = 0.1953
F MG/MMM = 375.9762	F MG/MMM = 361.5886	F MG/MMK = 446.9172
F LB/HR = 35.8687	F LB/HR = 42.9696	F LB/HR = 55.5470
F KG/HR = 16.2684	F KG/HR = 19.4910	F KG/HR = 25.1961

21	JUNE	89
----	------	----

21 10000 01				CLEAR, BOIL. 1, RUN	3
		XROM THE	TU F.		RUH
XRON *METH	5"	RUN HUMBER	והי	METER BOX Y?	S.III
RUN HUNBER		CLEAR, BOIL, 1, RUN	2	1.0020	RUN
CLEAR, BOIL, 1, RUN 1			RUN	DELTA H? 1.4500	RUN
METER BOX Y?	RUH	METER BOX Y?		BAR PRESS ?	KUII
	RUN	1.0920	RUS	29,0500	RUN
DELTA H?	1001	DELTA H?	DI III	METER YOL ?	
	RUR	1.5900 BAR PRESS ?	KNA	37.4070	RUN
BAR PRESS ?		29.0500	RUN	MTR TEMP F?	
	RUN	METER YOL ?	NV.	101.0000	RUN
METER YOL ?		38.4120	RUK	% OTHER GAS	
	RUN	MTR TEMP F?		REMOVED BEFORE	
MTR TEMP F? 80.0000	RUN	94.0888	BÜH	DRY GAS METER ?	RUN
% OTHER GAS	Kūn	% OTHER CAS	•	STATIC HOH IN ?	1750
REMOVED BEFORE		REMOVED BEFORE		-,1280	RUH
DRY GAS METER ?		DRY GAS METER ?	RUN	STACK TEMP.	
	RUN	STATIC HOW IN ?	RUR	291 .00 08	RUK
STATIC HOW IN ?		-,1200	RUK	ML. WATER ?	
	RUN	STACK TEMP.	200	94.0000	RUG
STACK TEMP.	8.00	288.0000	ĶÜВ	% CO2?	
	RUH	ML. WATER ?		11.5000	Rin
ML. WATER ?	RUN	103.0000	RUN	%-OXYGEH?	
••	KUO -	% CO2?		8.5900	RUN
% CO2? 6.9000	RUN	10.4690	RUN ·	% CO ?	
% OXYGEN?	1,211	% OXYGEN?	RUH		RUH
	RUN	9,6000 % CO ?	KUN	NOL WY OTHER?	600
% CO ?		4 00 :	RUN-		RUN
	RUR	MOL WT OTHER?	1141	MWd =30.18	
MOL AT OTHER?			RUH	MW WET=28.79	
	RUR				
MWd =29.62		MWd =30.05			
MW_WET=28.34		NW WET=28.61		SORT PSTS ?	
MM-MC1-COLOT				8.2914	RUH
		SQRT PSTS ?		TIME MIN ?	Dist
SORT PSTS ?		8.7299	RUH	60,0000	RUN
9.4202	RUH	TIME MIN ?	1,411	NOZZLE DIA ? .3770	RUH
TIME MIN?		60.0000-	RUN	STK DIA INCH ?	KOH
	RUH	NOZZLE DIA ?		83,0000	RUN
NOZZLE DIA ?	RUH	.3778	RUN		
.3778 STK DIA INCH ?	KUN	STK DIA INCH ?	-800	* YOL MTR STD = 34.	377
	RUN	83.0000	PUN	STK PRES ABS = 29	
00,000	33.01	* VOL MTR STD = 35.7	750	VOL HOH GAS = 4.4	
* YOL MTR STD = 39.85	56	STK PRES ABS = 29.		% MOISTURE = 11.4	
STK PRES ABS = 29.0	34	VOL HOH GAS = 4.85		MOL DRY GAS = 0.8 % HITROGEH = 80.0	
YOL HOH GAS = 4.94		% MOISTURE = 11.94		MOL HT DRY = 30.1	
% MOISTURE = 11.03		MOL DRY GAS = 0.88	31	MOL NT WET = 28.7	
MOL DRY GAS = 0.890	3	% NITROGEN = 80.08		VELOCITY FPS = 20	
% NITROGEN = 88.18 MOL HT DRY = 29.62		MOL WT DRY = 30.05		STACK AREA = 37.5	
MOL NT NET = 28.34		MOL HT HET = 28.61		STACK ACFM ≈ 46,4	22.
VELOCITY FPS = 23.5	58	YELOCITY FPS = 21.		* STACK DSCFM = 28,	
STACK AREA = 37.57	= =	STACK AREA = 37.57 STACK ACFM = 49.03		% ISOKINETIC = 9	9.81
STACK ACFM = 53,15	3.	* STACK DSCFM = 29,5			
* STACK DŚCFM = 32,4	47.	2 ISOKINETIC = 97		CUT OC CICIA BOTO	-
% ISOKINETIC = 99	.29	97	· = = -	END OF FIELD DATA	
		91			

RUN NUMBER

21 June 89 Emission Calculations

UPAN AMAG	CEI Or	XROM- MASSFLOR	XROM *MASSFLO*
XPON THAS	arte.	RUN NUMBER	RUN NUMBER
RUN HUMBER 2.1000	Pluí	2.2000 RUN	2.3000 RUM
		YOL MTR STD ?	YOL MTR STD 2
YOL MTR STD ?		35.7590 RUK	34.3770 RUB
39.8568	P['F	STACK DSCFM ?	STACK DSCFM ?
STACK DSCFM ?		29,583.0000 -RUN	28,066.0000 RUK
32,447.0000	.pui:	FRONT 1/2 MG ?	FRONT 1/2 MG ?
FRONT 1/2 MG ?		310.2000 RUN	-425.3000 RUN
204.6000	Bfik	BACK 1/2 MG ?	BACK 1/2 MG 2
BACK 1/2 MG ?		0.0000 PUN	0.0000 PUN
0.0000	RUN		1,20
		F GR/DSCF = 0.1339	F GR/DSCF = 0.1909
F GR/DSCF = 0.0792		F MG/MMK = 306.3397	F MG/MMH = 436,8922
F MG/MMK = 181.2837	?	F LB/HR = 33.9451	F LB/HR = 45.9289
F LB/HR = 22.0325		F KG/HR = 15.3975	F KG/HR = 20.8334
E KC/Hb = 8 8848		·	

2	2	D	M	e
4	-	V	WI	C

		22 June			
22 June 89			•		CLX
Lleur AFS		XRUM: *	NETH 5.	XROM "ME	TH 5
Lieur Aris		RUN NUMBER	IILIJI V	RUN HUMBER	
XRON "METH	5"	2.9999	RUN	3.0000	RUH
RUN NUMBER		METER BOX Y?		METER BOX Y?	
	RUN	1.0020	RUH	1.0020	RUN
METER BOX Y?		DELTA H?		DELTA H?	8
	RUR	1.9188	RUI:	1.9100	RUN
DELTA H?		BAR PRESS ?		BAR PRESS ?	800
	RUN	29.2598	RUS	29,2500	RUN
BAR PRESS ?		METER VOL ?		METER VOL ?	5 1111
	RUK	34.8940	RUN	36.6578	RUN
METER YOL ?		MTR TEMP F?		MTR TEMP F?	61111
	RUK	74.0000	RUR	80.0000	RUN
MTR TEMP F?		STATIC HOH IH ?		STATIC HOH IN ?	51111
	SUH	0800	RUR	0806	RUH
% OTHER GAS	÷	STACK TEMP.		STACK TEMP.	81111
REMOVED BEFORE		275.0000	RUN	275.0000	SON
DRY GAS METER ?		ML. WATER ?		ML. WATER ?	01111
R	RUR	92.8889	RUK	93.9080	RUN
STATIC HOH IN ?					
	Sile	% C02?			
STACK TEMP.		13,3000	-RUI:		
	(ÚH	% OXYGEN?	KUI	% CO2?	
ML. WATER ?		6.7000	RUN	13.3000	RUH
101.8000 P	NA CONTRACTOR OF THE PROPERTY	% CO ?	8011	% OXYGEH?	
		4 00 :	RUN	6.7000	RUN
% CO2?			KON	% CO ?	17.511
13.3000 R	WN	MWd =30.40			-RUH
% OXYGEH?		MW WET=28.98			11.5.11
6.7000 R	kura	IIM ME1-201-70		MWd =30.40	
% CO ?				MW WET=29.82	
. g.	WH	SORT PSTS ?		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
MOL HT OTHER?		7.8886	RUN		
-R	NUR .	TIME MIN ?	KUN	SQRT PSTS 2	
		60.0008	RUN	8.8667	RU!!
MWd =30.40		NOZZLE DIA ?	KUN	TIME MIN ?	
MW WET=28.90		.3778	DIM	60.9999	RUH
		STK DIA INCH ?	RUN	NOZZLE DIA ?	1021)
		83.0000	กาน	.3778	RUN
SORT PSTS ?		03.0000	RUN	STK DIA INCH ?	15011
-8.2144 R	UR	* YOL MTR-STD = 33.5	050	83.0000	RUH
TIME MIN ?		STK PRES ABS = 29		0010000	KON
	UH	_		* YOL-MTR STD = 35.2	279
NOZZLE DIA ?		VOL HOH-GAS = 4.3		STK PRES ABS = 29.	
	UH	% MOISTURE = 11.40	_	YOL HOH GAS = 4.42	
STK DIA INCH ?	,	MOL DRY GAS = 0.80		4 MOISTURE = 11.13	
	UN	% NITROGEN = 80.00		MOL DRY GAS = 0.88	
-		MOL HT DRY = 36.40	_	% NITROGEN = 80.00	
* YOL HTR STD = 35.804	-	MOL MT HET = 28,98		MOL WT DRY = 30.48	
STK PRES ABS = 29.24		VELOCITY FPS = 19. STACK AREA = 37.57		MOL WT WET = 29.82	
VOL HOH GAS = 4.79				VELOCITY FPS = 19.	
% MOISTURE = 12.04		STACK ACFM = 43,86 * STACK DSCFM = 27,2		STACK AREA = 37.57	
MOL DRY GAS = 0.880				\$19CK ACFM = 44,83	
% NITROGEN = 80.00		% ISOKINETIC = 10	36.0¢	* STACK DSCFM = 27.9	-
MOL HT DRY = 30.48				* 51HCK DSCFN = 27/3	
MOL WT WET = 28.90				4 190KINC = 10	11.74
VELOCITY FPS = 28.29					
STACK AREA = 37.57					
STOCK HEER - 35.37					

99

STACK ACFM = 45,742. * STACK DSCFM = 28,327.

% ISOKINETIC = 99.88

Emissions Calculations 22 Jun 89

XROM *MASSFLO*	XPOM "MASSFLO"	
RUN HUMBEP	RUN HUMBER	XROK *MASSFLO*
1.0000 RUK	2.0000 RUN	RUN HUNBEP
YOL MIR STD ?	YOL MTR STD ?	3.8006 RUN
35.0040 RUN	33.9590 RUK	0.0000 100
STACK DSCF# ?	STACK DSCFM ?	VOL-MTR STD ?
28,327,0000 RUI	27,290.0000 RUN	35.2780 RUK
FRONT 1/2 MG ?	FRONT 1/2 MG ?	STACK DSCFN ?
245.3000 RUN	216.2000 RUK	27,974.0000 -RUN
BACK 1/2 MG ?	BACK 1/2 NG 2	FRONT 1/2 MG 2
0.0000 RUK	8-8000 Kûk	198.7000 RUN
		BACK 1/2÷MG ?
		-0.0000 -PUN
F GR/DSCF = 0.1081	F GR/DSCF = 0.0982	
F MG/MMK = 247.4724	F -MG/MMN = 224.8266	
F LB/HP = 26.2578	F LB/HR = 22.9817	F GR/DSCF = 0.0869
F KG/HR = 11.9105	F KG/HR = 10.4245	F MG/MMM = 198.9028
		F LB/HR = 20.8414
		F KG/HR = 9.4537

Appendix J
Calibration Data

102

TYPE S PITOT TUBE INSPECTION DATA FORM

#8A

Pitot tube assembly level? yes no Pitot tube openings damaged? yes (explain below) no $\alpha_1 = 1 \circ (<10^\circ)$, $\alpha_2 = 2 \circ (<10^\circ)$, $\beta_1 = 0 \circ (<5^\circ)$, $\beta_2 = 2 \circ (<5^\circ)$ (0.938) $\gamma = 1 \circ$, $\beta_1 = 10 \circ (<5^\circ)$, $\beta_2 = 10 \circ (<5^\circ)$ (0.938) $\gamma = 10 \circ (<5^\circ)$ $\gamma = 10 \circ (<5^\circ)$

Calibration required? _____ yes ____ no

Quality Assurance Handbook M2-1.7

METER BOX CALIBRATION DATA AND CALCULATION FORM

(English units)

Meter box number Nutch #2 Date 21 Nov 88 Calibrated by Scott & Vauahn Barometric pressure, $P_b = 30.02$ in. Hg Gas volume Temperature Dry gas meter Wet test Dry gas Wet test Orifice Time Outlet Inlet manometer meter meter (V_U), (v_d) , (t_u), **(θ)**, setting (ΔH) , ft³ ft³ ٥F in. H min in. H₂0 75 5.057 0.5 5 77 77 536 1.0 5 17537 10 1.5 10 2.0 3.0 10 4.0 10

ΔH, in. H ₂ O	<u>ΔΗ</u> 13.6	$Y_{i} = \frac{V_{w} P_{b}(t_{d} + 460)}{V_{d}(P_{b} + \frac{\Delta H}{13.6}) (t + 460)}$	
0.5	0.0368	(5)(3¢.¢2)(537.75) (5.¢57)(3¢.¢2++\$=)(535)	$\frac{(0317)(.5)}{(30.02)(537.75)} \left(-\frac{(535)(12.4)}{(5)}\right)^{2}$
1.0	0.0737	(5,831)(30.02+15.)(536)	(6317) (1.0) (536) (9.14) 2 (30.02) (542.5) 5
1.5	0.110	(10) (30.02) (547.75) (10.161) (30.62+156) (537)	(0317)(1.5) (538)(1538)] ²
2.0	0.147	(10) (30.02) (552) (10.23)(30.42 + 2.0) (538)	(6317)(2,0) (538)(13,45) 2 (50,03) (532)
3.0	0.221	(10) (30,62) (554.75) (10,117 (30,02 + 73) (538)	(0317\30) (3000) (554.75) [538\()0.92)]2
4.0	0.294	(10) (30.02) (557)	(6317)(4.4) (538)(9.35) 2 (30.00)(557) (538)(9.35)

If there is only one thermometer on the dry gas meter, record the temperature under $\mathbf{t}_{\mathbf{A}}$.

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Out (lear & Eielson) Pretest Y Dry gas meter number 39.123 in. Hg Barometric pressure, $P_{\rm h}$ = Test number ONE

Orifice	Gas volume	olume	T	Temperature	ure					Y
manometer	Wet test	Dry gas	Wet test	Q	Dry gas meter	eter				-4
setting,	meter	meter		Inlet	Outlet	Inlet Outlet Average				$V_{\rm w} P_{\rm h} (t_{\rm d} + 460)$
(₩)	(ď.),	(^) 	(t.)	(t,),	(t,), (t,),	(t,),"	Time	Vacuum	Υ,	
in. H_2^0	ft³	ft ³	— 6	;- E	3° 8	H	(e) •	setting,	-	$V_{\rm d} \left(P_{\rm b} + \frac{\Delta H}{2} \right) \left(t_{\omega} + 460 \right)$
				1	Į,		מזש	nn. ng		(13.6/\ /
111			80 CHO	4.4	85	,		,		(27/12)(24/17)
!	10	712'01	\$0 270	43220	85 545	547.5	15.67	4.0	5.7.57	43550 85545 547.5 15.67 4.0 3.77.1 10.25. (29.123+ 法) 540
1,	10	10,223	541	43554	9 175 68	13 554 87 546 550 15.83	15.83	4.0	40 0.991	10.(29.133) 50.
17 /	0,0	1,247	102 18	95.76	87	10 1 10	,	7 07		
Ţ	21	12.0	11.5	1965535	15.14cg8	16.5 2 6.1 6.2 6.1 16.8 1.5 6.5	10.16	4.00	0.765	4.0 10.16510.347 (29.163+ 126)5515

 $^{\mathsf{a}}$ If there is only one thermometer on the dry gas meter, record the temperature under t $_{\mathsf{d}}$

 $V_{\rm w}$ = Gas volume passing through the wet test meter, ft³.

 $V_{
m d}$ = Gas volume passing through the dry gas meter, ft 3

 $t_{\rm w}$ = Temperature of the gas in the wet test meter, $^{
m oF}$.

11240 K- A -> 1.007

y t 5.0501

= Temperature of the inlet gas of the dry gas meter, oF.

= Temperature of the outlet gas of the dry gas meter, oF. a_d t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_d , and t_d , oF. $\Delta H = Pressure differential across orifice, in. H₂0.$

= Ratio of accuracy of wet test meter to dry gas meter for each run.

= Average ratio of accuracy of wet test meter to dry gas meter for all three runs;

= Barometric pressure, in. Hg. a a

 θ = Time of calibration run, min.

Quality Assurance Handbook M4-2.4A

NOZZLE CALIBRATION DATA FORM

21 JUNE 89 20 JUNE 89

Date 19 JUNE 89 1 Calibrated by MAJ GARRISON

			. a		
Nozzle identification	D_{2}	ozzle Diam	D ₂ ,	$\Delta D, b$	D _{avg}
number	mm (in.)	D ₂ , mm (in.)	D ₃ , mm (in.)	imm (in.)	•
	0.1377	0.377	0.377	0	0.37
				_	
	,	,		<i>t .</i>	

where:

a_{D_{1,2,3}} = three different nozzles diameters, mm (in.); each diameter must be within (0.025 mm) 0.001 in.

b $\Delta D = \text{maximum difference between any two diameters, mm (in.),}$ $\Delta D \leq (0.10 \text{ mm}) \ 0.004 \text{ in.}$

 $D_{avg} = average of D_1, D_2, and D_3$

Quality Assurance Handbook M5-2.6

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